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A NOTE TO OUR SUBSCRIBERS:

Yes, it's true that our subscription policies and irregular publishing schedule have caused some confusion in the past. As a young publication, we've gone through many growing pains, including various format, style and personnel changes.

Now for the good news. Those of you who recently subscribed for a year expect to receive 2 issues of *HighFrontiers* magazine and 4 issues of *Reality Hackers Newsletter*. And those of you who subscribed for 2 years expect twice as much — but you're going to get more than you bargained for. Beginning with this issue, *Reality Hackers* has become a full-size magazine. Currently, we're making the transition to a quarterly production schedule by publishing alternate issues of *High Frontiers* (with its themes, such as the upcoming Music & Consciousness issue) and *Reality Hackers*. Under our new policy all 1-year subscribers will receive 6 magazines (3 *High Frontiers* & 3 *Reality Hackers*) over a 1-1/2 year period, instead of 2 magazines and 4 newsletters. All 2-year subscribers will receive a total of 10 magazines (5 of each) over a 2-1/2 year period.

For the first time in our history we're confident we can publish high-quality magazines on a quarterly basis. And that's exactly what we intend to do. We'd also like to thank our charter and patron subscribers for their patience. As most of them already know, they'll get their money's worth — and more.

MONDO BIZZARRO

Anyone out there notice the cresting surreality of our times? It's almost as though there's a vast molten core of the phantastical and the absurd, an Agartha or never-neverland of the imagination where oxymorons walk hand in glove with palpable metaphors. Every once in a while these crop up in our Everyday Reality — in the form of information viruses, popular delusions, cults and weird news stories. Curiouser and curiouser our world is becoming — a place where the wildest nurslings of the human imagination are becoming everyday institutionalized realities.

The *Weekly World News* probably better reflects the popular imagination than the *New York Times* or even the *San Francisco Chronicle*. Where else can you find articles as full of drama and pathos, not to mention subtle ethical implications, as in "**Two-Headed Teen Cuts off his Spare Noggin**"? Nineteen-year old Jayanti Gauri of Bangalor, India had two heads growing out of one neck — the "spare" head was slightly smaller but of average intellect, and by Gauri's own admission, it protested vigorously.

I can't help feeling that this tale is somehow a parable for our times.

But which of our heads is dominant? And is it in our interests to simply lop off the other one? There are those who maintain that cognitive science and emerging information technologies will help us bridge the gap between the soulless computer and the humanistic imagination. **Hypertext**,

cyberpunking, video graphics and computer play are all tools of the mutant two-headed cyber pilot of the 90's.

STEAL THIS FIRE: THE NEW PROMETHEANS

Our subtitle, *Information Technologies & Entertainment for those on the Brink* is, in part, a sly attempt to be stocked by computer stores. Hey! Why do those computer magazines have

to be *sooo* boring. Does anybody out there find photographs of computers exciting or erotic?

Speaking of erotic, we have our Most Valuable Philosopher, **Timothy Leary**, teamed up with computer wiz **Eric Gullichsen** scoping out Artificial Realities. Eric was recently beamed into the San Francisco Bay Area by **Autodesk**, to work on a mysterious project inspired by **G. Spencer Brown's** *The Laws of Form*. Autodesk also teleported **Ted Nelson**, the philosopher king of the **hyperworld**, and announced at the recent computer fair its full support for **Project Xanadu**. Watch for an unusual and original conversation with Ted in an upcoming issue of *Reality Hackers*.

DOKTOR MABUSE

HACKER TO THE M-M-M-MAX

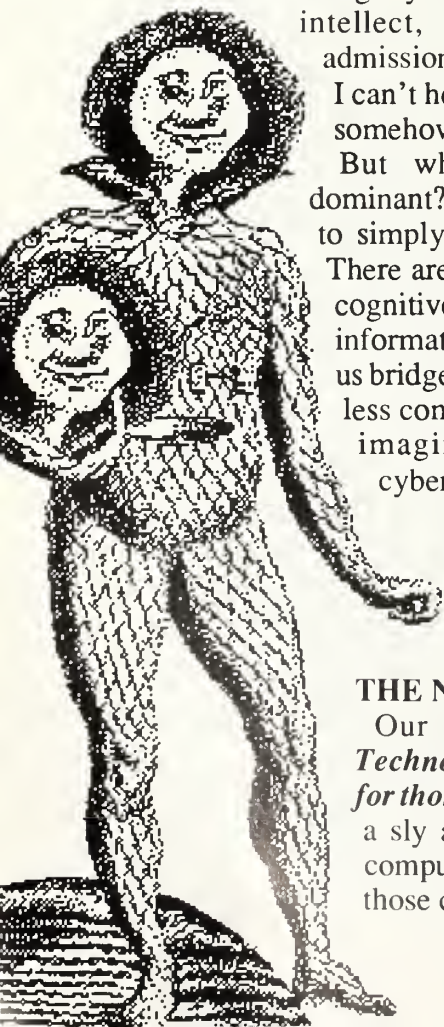
If more people knew what these hackers could do, they wouldn't even bother voting in these silly Presidential TV Game Show Sweepstakes. (Come to think of it, most of us don't.) After talking to some of the more sophisticated of these characters, I'm convinced that the entire electronic infrastructure upon which the various power elites rest, is up for grabs. More than that, I may not now reveal.

However, starting in this issue, our own **Morgan Russell** (who will surely be some day recognized as the **Hunter Thompson** of Cyberdelia) will reveal to you the mysterious workings of **Doktor Mabuse** — Hacker Extraordinaire. This time around, you'll find out how individuals and independent groups can access Network Television Time. Satellite hacking and pirate TV may become the graffiti art of rebellious aristocratic techies. Now *that* ought to tear a hole in the fabric of consensus reality big enough to fly a **Moller VTOL** craft through.

IF THE HACKERS DON'T GETCHA/ THEN THE PSYCHICS WILL!

Lawrence Gerald chats with **Andrija Puharich**: it's psionic intrigue and adventure with government agents, **Uri Geller**-kids who could start **WWIII** and protective devices for shielding against **E.L.F.** waves.

And, in the *PSYCHESUPERSONIC CUTTING EDGE*, **Musaio** — CyberMystic author of *The Lion Path* and *Consciousness and Reality* — invites you to join him at *The Tantaric Wedding of Physics and Psychology* for a little *Ultrasonic Brain Music*.



Nick Herbert shows us how time travel is possible without rotating the whole universe in *Yesterday is Just a Spacetime Twist Away*. Some of **Einstein's** equations describe accessible pathways called "closed timelike loops," or CTLs, that actually wind back into the past and Nick hacks the brush away from some of these paths.

LOOK, MA. NO DRUGS!

In this, our first F.D.A.-approved issue of *Reality Hackers*, we have foregone the usual rash of drug-oriented material and our traditional scratch-and-sniff intoxicant centerfold. Nancy will be pleased. But not *too* pleased, as we look at some novel and legal ways to access altered states — Mind Machines and PsychoActive Soft Drinks.

Jay Cornell, co-publisher of *Gnosis* magazine, looks at the current state of mind machines. It is not unlikely that, as we learn more about the neurohormonal effects of light, sound, and electromagnetic frequencies, **mind machines** may give people what they seek from psychoactive drugs at the push of a button or the flick of a switch. **Dial-a-consciousness!**

Durk Pearson & Sandy Shaw are frequent visitors to *Reality Hackers*. This time through, they've brought some psychoactive soft drinks with them — all natural, all nutrient — yet they have very *powerful* effects on the brain. "Rise and Shine," for example, has been clinically shown to turn **wimps into warriors!**

Is **Berlin** where it's at nowadays? And maybe even **Moscow**? Should the hip and the hopeful be looking to the East? **Terence McKenna** thinks so and tells us about it in this issue's endpaper, **Psychedelic Futurology** in Berlin.

Well, there you have it. We hope that we're at least as exciting as the **Weekly World News**. And marginally more scientific.

In the final analysis, of course, it's *all* science fiction. We're living it!

-- R. U. SIRIUS
-- QUEEN MU

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The Forum features a monthly theme presentation from persons on the cutting edge of fringe science, frontier technology and consciousness research — often followed by a networking session where individuals have the opportunity to meet like-minded people, promote individual and collective projects and make necessary connections for the realization of goals and visions. The Forum takes place each month.

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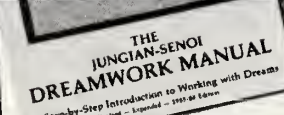
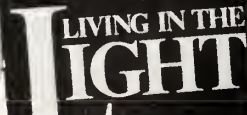
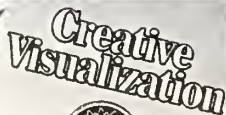
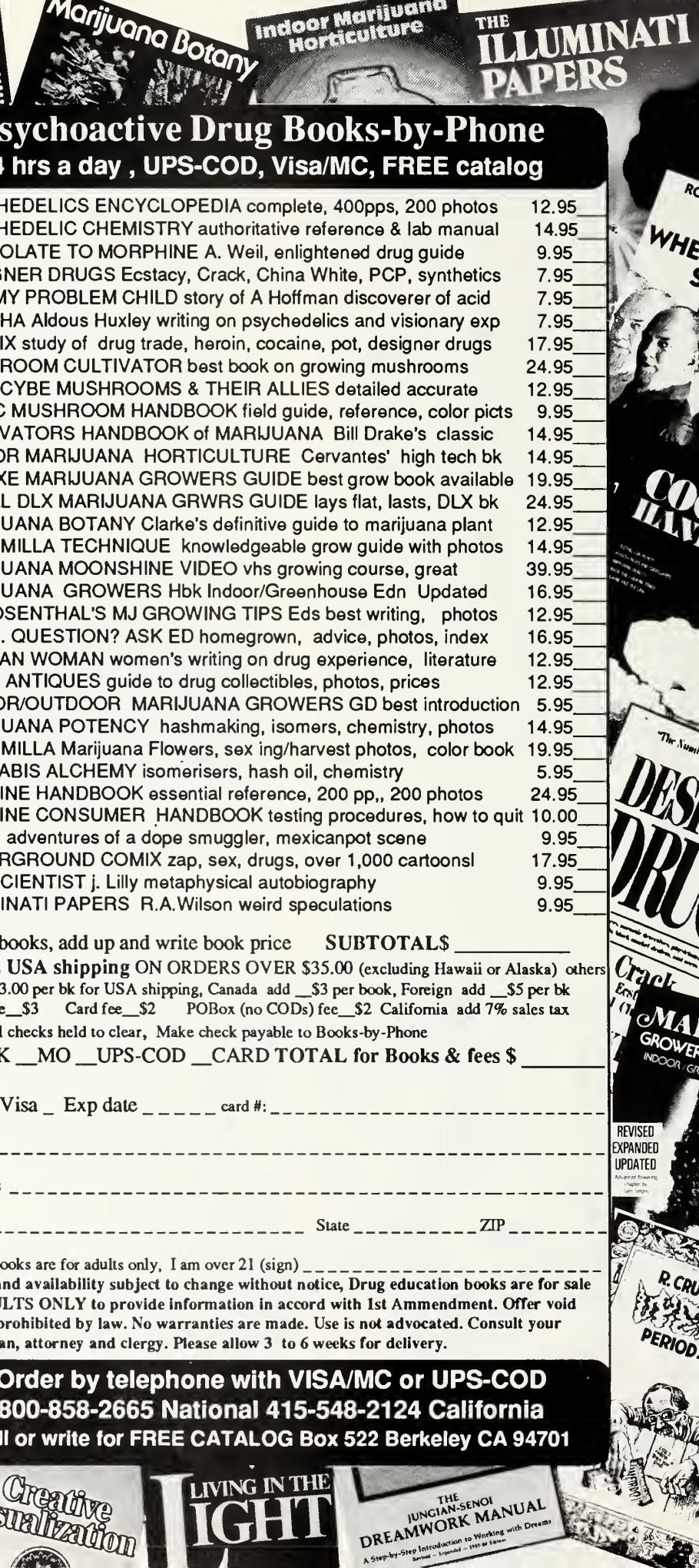
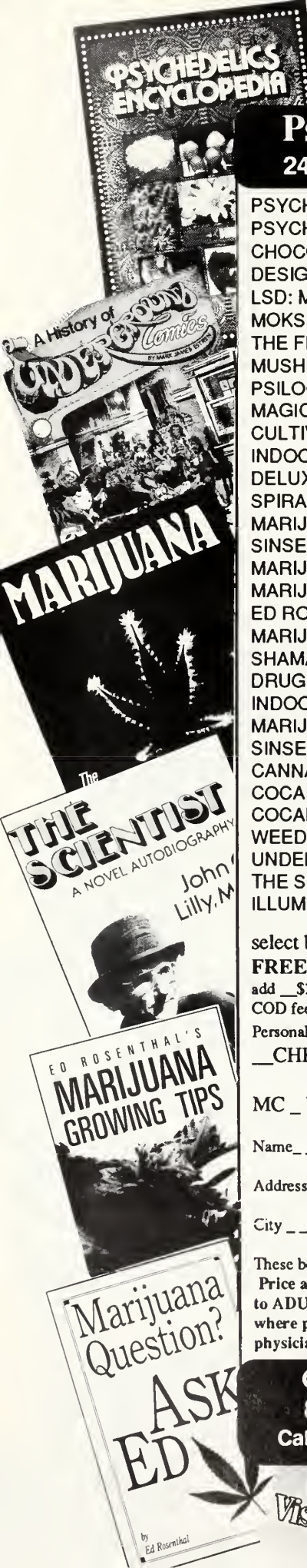
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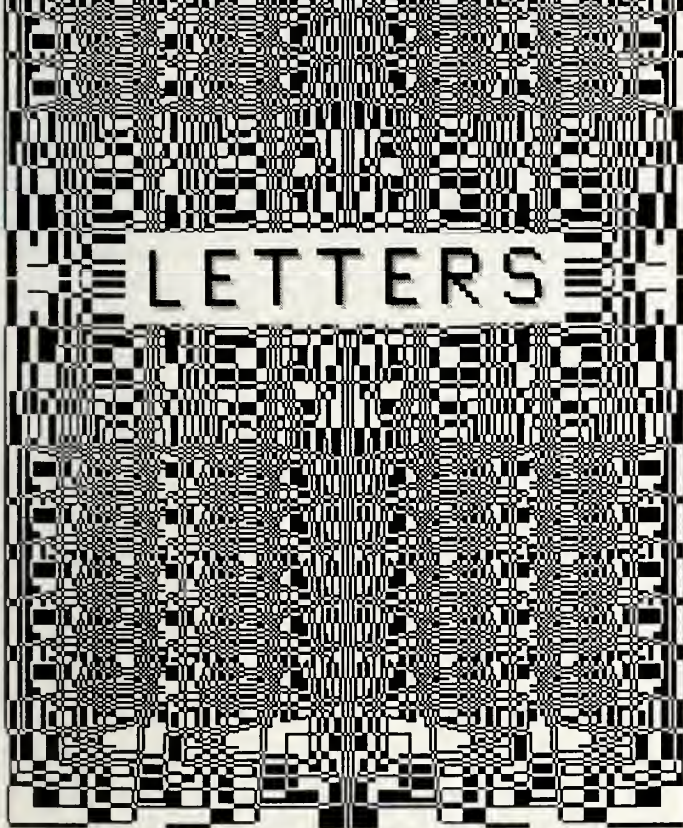
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High Frontiers:

I was pleased to see Martin Lee's piece (*HF* #4) begin to place charges at structural points in the "big board" game of low-intensity warfare we all know and love and accuse our enemies of employing exclusively, the game of PSYWAR and PSYOPS.

This *war* is characterized by its heavy emphasis upon creating the psychological predisposition towards behaving favorably regarding one faction or another within the paradigm of a set of given trigger stimuli camouflaged within the fabric of social expectation. The key idea is camouflage. Carl Gustav Jung was a Nazi. Like his control agent Allen Dulles. The "Age of Aquarius" is a Nazi geo-political operations concept equivalent to "Lebensraum", "Strength Through Joy", "Volksgeist" and "Arbeit Macht Frei". You know, and I know you know. You know I know you know. I know you know I know you know. Sure it hurts.

How do smart guys get fooled? How much can be revealed without getting one's ass into some hypno-programmed Manchurian Candidate's sight-picture? What agencies of geo-political insight are responsible for this latter day wiseing up? How does your average

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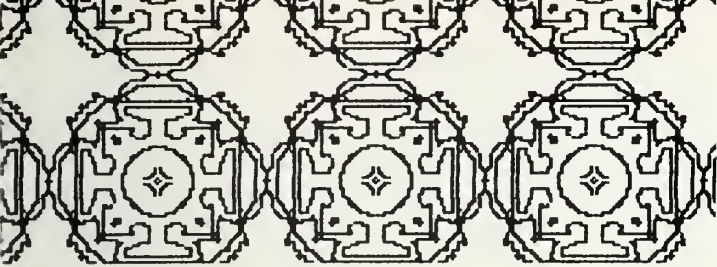
Walter Alter
San Francisco

Dear Editors

Since reading R. U. Sirius' opening sermon
in HF#4 on the new species coming of age in this
information age, I have been allocating a goodly
portion of my conscious mind to the AMEN of
creating such a free information network. What
I mean by free is the freedom to access and
disseminate information at cost.

We now have almost at our fingertips (or
most probably at our voice-tip, through the grace
of Artificial Intelligence) a true global network
of simultaneous thought, decision, creation, on
the physical level. We can be freed now from the
multi-national or state-owned newswire "serv-
ices." The motto is no longer "All the news that's
fit to print," but "All the news is fit to access."
Imagine instant reporting from anywhere on the
planet and instant accessing, with the buttons
presenting a list of abstracts on that theme. A
planetary poll could be in constant existence,
doing away with the "representative" type of
government now in existence. I am not quite sure
as I write this, just what kind of government this
will be, since every member of this species
would have the ability to pilot the course of the
species. Some management would be needed,
but these managers would undergo a continuous
popularity poll through the free information
network, until the support level fell to a level
calling for a recall. Terms would be irrelevant.

If we combine this with Nick Herbert's
thoughts about a Culbertsonian mind synthe-



sizer and clear-loop links, we are indeed in for species-think and species-action and, hopefully, species love.

Finally, I would like to broadcast an important event in Sweden on the island of Gotland near the old Hanseatic League town of Visby. On July 1, 1988, The Einstein-Hermanns Foundation, of which I am a director and the Secretary-Treasurer, will open the World Youth Friendship Parliament. Already the Nobel Laureate in Literature, Wole Soyinka of Nigeria, has announced he will attend. We would like as many Nobel laureates and common and uncommon people as possible to come.

The basis of the youth parliament is acting out of intuition and not out of fear or insecurity. If any one of you has contact with Pink Floyd or another sympathetic band, I would be most grateful for an introduction to enlist their assistance. We've purchased a 54 acre estate, Muramaris, which is really magical. And we are just a couple of kilometers from the walled medieval town of Visby, so one's imagination can really be stimulated. For those wishing hotel accommodations, they can contact me at 415-332-4335 by voice and 415-332-6106 by modem or via Tymnet (setup is 7-E-1, use lowercase), or Hotel Snack (Tel.011-46-498-60000, Telex 4104 SNACKS, or Box 1074, 62121 Visby, Sweden).

That's the void from here. Greetings to all out there.

Ken Norton/Everjoy
San Jose

Hello R. U. Sirius!!

I must begin by saying that I enjoy *High Frontiers* a whole lot. The 1987 Annual left me fairly ecstatic: The large format, pages of fascinating type by Gracie & Zarkov, Tarantula Venom . . . etc. *Big* fun for my brain, you know? And though this latest issue comes-off like a

new-age *High Times*, almost, there was some really interesting material nonetheless. The *Beastie Boys* piece was simply **UNFORGIVEABLE!!** . . . Gee, that felt good! Anyway, I await each report eagerly.

Yours,
Roscoe
Islington, Ontario

Boy, do you guys piss me off with your chemical stew, phew. P. U. stinko. How about printing your true motives. What stocks do you own boys?

I'm making small tens units and setting them loose everywhere . . . see you in the funny papers.
Sincerely,
Clyde O. Scopia
Davenport, California

Dear Skinny Lean Doe,

Loved your party!! And the Anagram program sure beats charades! (Ars Magna © 1986 by Michael Norton — Boston Computer Society Mac Group, One Center Plaza, Boston, MA. 02108) Anagram generation is intriguing. Got me thinking there must be some connection twixt queenmu and quantum theory. How about **QUEEN MU'S TANTRALITY = QUANTUM REALITY NETS?**

In all your delvings, have you run into anything on the cymbalon? My gleanings are slim, but it seems to have been a scientific instrument used by early savants. There are Renaissance examples that survive in obscure regional museums in Italy, but the principle may go back to ancient Chaldea. They seem to have consisted of a quartz prism fitted at each end with brass tympan. The Brass plates were inscribed with letters in dial formation. The crystal was broken in two, or came in two parts (like cymbals), and were used for some sort of transference of energy. I can't help feeling there's a quantum connection here. Any two quantum objects that have once interacted are joined together by a kind of cosmic glue that acts instantly even across light-years distances to inform one object about what is happening to its partner.

Quantum objects “stick together” by a kind of voodoo influence, like the supposed distant influence of hair or nail clippings. In Schroedinger's day this quantum connection was regarded as a theoretical artifact — like the International Dateline — not a real feature of the quantum world. Just as you can't really go back in time using the dateline, you can't use the quantum connection for any kind of instant communication. In 1965, Bell proved that the quantum connection was real. Real in the sense that to make the world work right — i.e. in accordance with the EPR experiment --- nature has to use actual superluminal voodoo links. So far it looks as though humans cannot gain access to these links. The quantum connection — is a private line accessible to nature alone, secured from human access by an unbreakable code to which nature alone holds the key. So far.

I'm off to Dallas for the Isthmus Institute Conference on Consciousness and the Physical World. Enclosed is the paper I've done for them “*Three Experimental Assaults on Quantum Reality*” and something for the next *Reality Hackers*: “*Yesterday is just a Spacetime Twist Away.*”

Long Live Queen Quantum!
Yours in the cosmic glue,
Nick (Herbert)
Boulder Creek, California

Fnords!

I like your magazine. To put it mildly, it overwhelmed me. So I thought I would drop you a letter and invite you to call my computer BBS if you have access to a computer system. We have ongoing discussions on drugs, sex, and magick, and other weirdness. (We are also official unofficial BBS of Cyberpunk International, but that is another story. Anyways why don't you give it a call, and meet all the mutants from around the country on my BBS.

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The Sysop, The Mad Chemist

GUNS DON'T KILL PEOPLE — IMAGES KILL PEOPLE.

I have made the catastrophic discovery that it is legal to murder, torture and mutilate people with pictures. The mass audience is in danger of total extinction through enjoyment. An international consortium of Entertainment Mafiosi, Information Control Tyrants and Image Gestapos have, through telegenetic engineering, created *metaviruses* in the form of pictures. These virus pictures are virtually indistinguishable from “normal” pictures. After entering through the eyes, they devour the imagination of their victim and replace it with the imagination of their parent body, i.e. one of the elite psychopaths who control the global entertainment ecology.

$$\frac{(DNA + CIA) \cdot \left[\begin{array}{c} \text{Libyan} \\ \text{gossip} \end{array} \right]}{\left(\begin{array}{c} 27.3 \\ \text{audience} \\ \text{share} \end{array} \right) \cdot \text{NBC}} \cdot \int \left[\begin{array}{c} \text{666} \\ \text{TV} \end{array} \right] = \frac{[AIDS + \text{Star Wars}] \cdot \$1,000,000,000,000}{\left\{ \begin{array}{c} \text{Mass} \\ \text{Hypnosis} \\ \text{Party} \end{array} \right\} - \left(\begin{array}{c} \text{Occult meaning} \\ \text{of} \\ \text{George Bush} \end{array} \right)}$$

$$\frac{\text{MEDIA GENOCIDE}}{\left[\begin{array}{c} 115 \text{ punches} \\ \text{landed by} \\ \text{Rocky in} \\ \text{Rocky IV} \end{array} \right]} = \frac{\sqrt{\text{crimes of democracy}}}{\sum \$25/\text{gram for crack} \cdot \left[\begin{array}{c} \text{"Morality} \\ \text{is} \\ \text{Trendy"} \end{array} \right]}$$

Rob Breznsny
World Entertainment War
Santa Cruz, California

Wha' hopen? You guys kick drugs, or what? I mean, seven paragraphs, no matter how supersyllabically entitled, is Terence McKenna *no*. And would even *People* ditch dinner with the 21st Century MVP after only drinks? “More air!” I hear the Art Director gasp. There are heads, and there are airheads.

High-school humor replaces Cosmic Giggle, lowering scientific integrity to mere triptease. I've heard “Captain Clearlight's” (SHAZAM and Gesundheit, kiddies) UFO story a dozen times and he always conscientiously reports how much scopolamine he imbibed.

Lest you not dismiss me as a nitpicker: you never before let a movie escape your copydesk misnomered (*Brainstorm*). Where was steel-trap Queen Mu? When will MacWord go Hollywood?

Finally, what ergomaniac indulged those cascading toilet rollouts of editor-glorification in “Steal This Conference,” an otherwise virtuoso weld of form, content and neurotantric word masturbation?

OK, you're still heads above Brands X, Y, and Z. Nick Herbert continues to create a universe where only mutants can read the roadmaps. I don't know whether an editor with a real name can survive there, but Morgan Russell sure can rip those keys. Marty Lee makes being paranoid fun.

But cut the shit. Listen, if there's a breakthrough in the grey room, you guys are leading the charge. I don't need my crystal to see the old format wasn't paying the rent. Let's all chant now, and envision those bowdlerized words as bubbles, holding *Reality Hackers* afloat above them, uncompromising and uncompromised forever, its megabrainbyte fatal to the status quo.

Omward,
Art Wand
Los Angeles

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Better Brain Change Through Electricity

MIND MACHINES TODAY

by Jay Cornell

Mind machines — technological devices that affect the mind — have arrived. Although the field is very much in its infancy, it's easy to perceive the outline of a future where these machines will play an important role — extending and expanding our faculties and allowing greater control over our mental states and moods. Recently, Michael Hutchison, author of the definitive book on mind-machine technology - Megabrain - hosted a workshop in Silicon Valley. Attendees were treated to hands-on (or is it heads-on?) demonstrations of a dozen gizmos. Jay Cornell is an Oakland-based technophile and assistant publisher of Gnosis magazine. Wearing his Reality Hackers beanie, he attended the day-long seminar and issued the following report.

Remember the hoopla about bio-feedback devices in the late '60s? They really could reduce stress and aid meditation, worthy - though not terribly exciting - goals. Then in *Megabrain* I discovered how mutant descendants of bio-feedback instruments had been designed to exploit the latest brain research findings and were, among other feats: allevi-

ating pain, curing diseases, sending people on mental trips to other planets, unleashing creativity, raising IQs, and growing hair on the bald. I realized we were in the early stages of yet another Brain Change Revolution.

MACHINES FOR CHANGING MINDS

This Revolution is in its wild and woolly early stages at the moment. The FDA watches carefully while a few doctors tentatively use some machines for treating stress, relieving pain and aiding wound healing, but these Authorities still pooh-pooh the more extravagant claims and warn against charlatanism. Meanwhile, eccentric experimenters and entrepreneurs are in their basements and garages building machines, just as the mid-'70s hackers built the first personal computers. On the research front, scientists are performing and replicating experiments that overturn long-held beliefs about the brain, and the results are adapted to the next generation of machines. The whole mind machine field is poised to take off. Right now, it's a growing but volatile mixture of scientific research, budding entrepreneurs, in-

spired amateurs, amazing “it changed my life” anecdotes, and a mildly cautionary press. It’s a lot like the state of psychedelic drug research 30 years ago.

MIND MACHINE DAY

The workshop was held at Tranquility Place, a Santa Clara “floatation/relaxation and health education center.” Claire Cloutier, co-owner of the center, also hopes to expand its offerings to include a “Mind Gym.”

Before the presentations began, I scouted out the attendees. They seemed like a smart and healthy bunch, though the Nerdiness Quotient exceeded the average. They looked like the sort of people who wanted machines that would *change their minds*: experienced meditators, New Agers, bright college students, and psychedelic computer programmers outnumbered the few middle-aged medical professionals and business-looking types. Most wouldn’t have been out of place at a Mensa meeting or a hackers convention.

It was rather ironic: a room full of obviously brighter-than-average people, drawn to machines that promise them even more intelligence, while those among us truly in need of better brains. . .

SCIENCE MARCHES ON

Michael Hutchison opened the day by summarizing theories and experiences that led to the mind machines. He’s covered it in detail in *Megabrain*, but it is such heartening news that I was happy to hear it again.

I remember, back in high school, a bit of folk wisdom. It said that we each had only a finite number of brain cells, and as we grew older they just slowly died off. The behavior of our elders did little to dispel this depressing factoid. Along with what I learned in biology about nerve tissue almost never regenerating, it seemed quite possible. Well, forget it. Repeated experiments by several world-class scientists have proven that stimulation can actually cause the brain to physically grow. Rats in boring

environments get dumber, but rats in enriched environments show growth in the size, interconnectedness and even numbers of neurons, dendrites and glial cells of the neocortex, which accounts for about 85% of the human brain and is the seat of our higher intellectual functions. This works with young rats and old rats (though more slowly in the latter), and in a strange echo of Lamarckism, even pregnant rats in enriched environments give birth to offspring with thicker cortices. (The mechanism for this transfer of effects through generations is not yet known, but it is interesting to note that it is a traditional belief in Japan and China that enriching the environment of the expectant mother will increase the intelligence of her child.) In fact, many anthropologists now believe that the use of tools actually *caused* the rapid growth of of our ancestors brains 2-3 million years ago. If this is true, then the use of tools which increase intelligence is among the oldest human traditions.

There are many ways to stimulate the brain. New experiences and more interesting environments work. Psychoactive chemicals can certainly change consciousness. The chemical model of the brain, dominant in neuroscience since the 1950s, led the way to the many advances in psychopharmacology and neurochemistry we’ve seen since then. Influencing the brain with chemicals is a tricky business, though. Chemicals are hard to synthesize, tend to be hard to control, have unwanted side effects, decrease in effect with continued use, and are mostly illegal. By the 1970s, many researchers were sidestepping these difficulties by studying and modifying brain activity using lights, sound, or direct electrical signals. Thus, today’s mind-altering machines use these safer and more controllable routes to the brain. Compared to chemicals, electrical signals are much easier to create, modify, send to the brain, and turn off. Research is safer and faster, and requires fewer hassles with existing bureaucracies.

Our brains produce a variety of simultaneous electrical signals, but many studies have correlated states of mind with certain brain wave

patterns. Rapid beta waves (about 13-30 Hz) are associated with normal, externally-directed consciousness. The slower alpha frequencies (8-13 Hz) are associated with relaxation. Theta waves (4-7 Hz), my personal favorites, accompany deep meditation and facilitate memory and learning. They are also associated with those striking images and vivid memories that often surprise us as we are about to fall asleep. Very slow delta waves (0.5-4 Hz) are usually produced during deep sleep, and seem to be associated with healing and with the “oceanic feeling.”

Repeated experiments . . . have proven that stimulation can actually cause the brain to physically grow



Neurologists have also found that the brain hemispheres normally operate in different rhythms and shift dominance back and forth. However, during certain desirable states such as deep meditation, creativity, and that hard to describe feeling of being at one with your experience, the two hemispheres are synchronized, or working in unison.

Pioneer biofeedback researchers Elmer and Alyce Green first explored alpha frequencies and their relation to meditation, but found that the most experienced meditators favored the deeper, more elusive theta frequencies. The Greens then created electronic devices that helped teach their subjects to reach the theta state. The results were surprising. Many of the subjects reported “integrative experiences” in which their lives took on more meaning. They felt oneness with the cosmos, had creative insights, and fell in love. Learning and memory improved and they rarely became ill. It was a

major breakthrough: using electronics, their subjects had learned how to achieve the benefits of years of difficult meditation training in a matter of days.

We now know that different waves and combinations of waves inhibit or stimulate the release of neurochemicals just as drugs can, though so far there are few generally agreed-upon formulas for producing specific effects. Various bioelectric researchers claim that by altering brain waves they can produce just about any mental effect you can imagine: not only stress reduction, higher IQ, better learning and more creativity, but also feelings of euphoria, love, nausea, and more. Physical effects, such as cures of chronic illness and strengthening of the immune system, have also emerged. Some devices have been shown to have a lasting, positive effect on the Neural Efficiency Quotient (NEQ), a standardized measure of brain function which correlates to intelligence but eliminates the biases of standard IQ tests. It’s no wonder the medical establishment tends to dismiss the most outrageous of these claims, and that a good deal of classified military research supposedly continues in both the U.S. and the Soviet Union. Obviously these techniques hold incredible promise for consciousness research.

While biofeedback devices help people learn how to train their brain waves by simply indicating when the desired range is reached, it’s easy to shift brain waves to the desired frequencies and into synchrony by generating pulses which the brain will follow. This process is called “entrainment.” There is still some controversy as to how helpful entrainment is in teaching the brain to achieve the various states without the external stimuli. Nonetheless, it is how most mind machines operate.

MODES OF INFLUENCE

The mind machines I’m aware of use one or more of the following means to send signals to the brain.

1) **Lights.** Aldous Huxley described his experiments with the strobe light in an appendix to *The Doors of Perception* and *Heaven and*

Hell. Today flashing lights are the most common feature of mind machines, and the one with the most immediately noticeable effects. Modified ski goggles or sunglasses with two to sixteen red LEDs (or small white lights) in front of each eye are wired to a device that controls the frequency, pattern, and sometimes the intensity of the flashing. With eyes closed for the strongest effects, everyone will notice that different settings produce different patterns and images. Different flashing frequencies also quickly produce different feelings, from excitement, or even anxiety with rapid flashing, to calm at slower speeds. I've seen a great variety of flickering, shifting moiré patterns, predominantly in dark red and deep blues and purples. They are similar to the phosphenes you can see by pressing with your fingers on your closed eyes, and are oddly involving. Occasionally other colors are seen, depending on the person and the frequency. Sometimes the brain will turn these patterns into stars, flowers, or other images, an effect that can be strengthened by simultaneous use of other modes of influence.

The Tranquilite, which uses a different kind of light stimulus, is discussed below under "Available Devices."

2) Electrical Pulses. Electrodes are placed on the earlobes, below the ears, or on the skull and send signals to the brain with very low-intensity current (thousandths or millionths of an amp). The combinations of signal strength, frequency, and wave shape influence the brain in a wide variety of very complex, mostly unknown, ways. One basic principle is a curious reflection of the techniques of homeopathic medicine: less current often has a stronger effect. It seems that by matching the strength of the brain's natural electricity one is able to stimulate the brain cells in a more natural way.

The frequencies used range from hundreds and thousands of Hz down to .5 Hz and below. Several researchers use 7.83 Hz, supposedly the resonant frequency of the Earth/ionosphere electromagnetic field, which is said to have a harmonizing effect on the mind and body. The late Michael Hercules, inventor of the Pulstar, found

that 1.05 Hz had strong healing effects. One balding black man found that frequency not only caused his hair to grow back, it grew back red. The color change is said to have startled Mr. Hercules, but the man explained that as a child his nickname was "Red" because he had red hair until he was 5 or 6.

Electrical stimulation tends to be more subtle in effect than light stimulation and often takes longer to create a noticeable change in consciousness.

3) Sounds. White noise or pink noise (white noise balanced to contain equal volume across all octaves), electronically-generated ocean waves and, occasionally, heartbeats are used to make the brain resonate. Although most of us can hear little or nothing below 40 Hz (where the most interesting brain-wave frequencies are), in the early '70s it was discovered that, if a different frequency was sent to each ear (say 200 Hz and 202 Hz), the brain would resonate at the difference between them (2 Hz). As with flashing lights, the brain may use the "meaningless" stimuli to hallucinate all sorts of interesting sounds, even music and voices.

These sounds may be used alone or inaudibly mixed with gentle New Age music. Headphones maximize the effects.

4) Spoken Words. "Hypno-Peripheral Processing" tapes are based on Neuro-Linguistic Programming and the work of Milton Erickson (arguably the greatest hypnotist and therapist of the 20th century). Using headphones, the subject listens to short stories, heavily laden with symbols, recited by soothing voices speaking v-e-r-y s-l-o-w-l-y. Two different voices read two different stories, one in each ear, a technique said to force the mind to bypass normal linear processing and absorb the information more directly. Proponents can point to many happy users, but many people (myself included) find this too annoying to experiment with for long.

5) Motion. Dancing, exercising and other movement has long been known to influence consciousness. The "witch's cradle," in which the user hangs in a harness and swings like a free

pendulum, is one traditional device that uses motion for consciousness alteration. Motion stimulates the semicircular canals and cilia of our inner ears, sending signals to the cerebellum, and sloshes the fluids that make up most of the body. The Graham Potentializer is the only modern mind machine I know of that uses this method, and it can have a profound effect.

6) Magnetic Fields. A few devices use pulsed magnetic fields, usually in conjunction with other means. Most claim only mild synergistic effects.

7) Ultrasonic. Long-time consciousness researcher Dr. Charles Musès is developing a device that stimulates the brain using ultrasonic waves sent directly into the brain, bypassing the ears altogether. More information on this technique appeared in *High Frontiers* #4 and still more will be revealed in future issues.

SOME OF THE AVAILABLE DEVICES

The Synchro-Energizer

One of the best known of the brain machines, and one of the best. It uses goggles with flashing lights and headphones playing synthesized sounds. The control panel contains a variety of switches and dials, making the Synchro-Energizer one of the most flexible machines available. It may be as powerful as the lights-and-sound approach can get, and nearly everyone who tries it for as little as five minutes will “feel different.” Unfortunately, it’s also one of the most expensive (about \$7,000), so a lot of the new mind machines promote themselves as “like the Synchro-Energizer but cheaper.” One Marin County entrepreneur has opened a Synchro-Energizer parlor called “The Universe of You,” where \$10 buys a 45 minute experience. The first mind machine I ever tried, it quickly took me into a mild psychedelic state. My breathing became slower and steadier, and the shimmering, mutating moiré patterns I watched behind my eyelids seemed utterly fascinating. I relaxed, sank into myself, began to drift, and then to think different thoughts about con-



sciousness, the brain, human evolution . . . and how I could get my hands on one of these machines.

The D.A.V.I.D. 1

Very similar to the Synchro-Energizer, for around \$3,500.

The MC²

A small handheld keypad hooked up to a pair of sunglasses with two LEDs per eye and a set of headphones, the MC² has 10 preprogrammed light and sound sequences of varying lengths which will lead you from the normal beta state down through alpha and into theta. This eliminates the need for conscious adjustment of frequency as you reach the desired states, which is helpful, but it also means the machine has total control over your trip. I was about two-thirds of the way through my sequence when someone kicked out the power cord, which ended the trip prematurely by resetting the sequence back to the beginning. Still, it’s only \$350.

The Alpha Stim

The Ferrari of the electrotherapy machines. Prescribed by numerous doctors for pain relief, as well as reducing anxiety and stress, its endorphin-releasing abilities have also been used to successfully detoxify cocaine addicts.

There was one at the workshop, but unfortunately when I got to it the people who knew how to use it were elsewhere. I was not about to clip the electrodes to my earlobes and just start

twisting dials, so I have no personal experience to report.

The RelaxPak

One of the many small, simplified models of electrotherapy devices available by prescription for about \$450. The size of a deck of cards, it has one control knob to adjust amplitude and a pair of electrodes that are placed under the ears. The frequency is fixed at 100Hz.

I used one for about fifteen minutes. The most noticeable effect was a slight, irregular pin-pricking sensation at the point where the electrodes were attached. Maybe I felt a little more relaxed and clearheaded afterwards, but it was hard to say. My test wasn't long enough to be sure of any effects.

The Graham Potentializer

Conceived in 1972 and first built two years later, the Potentializer is the only mind machine I know of that uses bodily motion to induce its effects. You lie on a large massage table while


enough to convince me of the possibility.

As with most of these devices, the Potentializer is said to induce relaxation, increase intelligence and promote better all-around brain function (specifically, a 20% increase in NEQ). Additionally, some very startling stories are told about it. In one instance, it seems to have helped reverse autism in a young woman. Michael Hutchison himself reports that after using one for 3 hours a day over 4 consecutive days he felt great for weeks and "spontaneously" stopped smoking. He hasn't smoked since.


Graham Potentializer kits start at about \$3,500 and assembled models at about \$7,000. Some people in the Bay area and elsewhere rent time on them for about \$40/hour.

Hemi Sync

Robert Monroe is the author of *Journeys Out of the Body* and founder of the Monroe Institute in Virginia (where you, too, can learn to



Influencing the brain with chemicals is a tricky business . . . Chemicals are hard to synthesize, hard to control, have unwanted side effects, decrease in effect with continued use, and are mostly illegal. . . Today's mind-altering machines use . . . safer and more controllable routes to the brain.



the machinery hidden underneath it slowly moves the table up and down in a circle about two feet in diameter. The gentle rising and falling, combined with a slight magnetic field near your head and whatever you've got on the headphones (I had a tape of some New Age music), will quickly put you into a state of relaxation and reverie. The unit I tried had a distracting rumble in the gearbox, but after only fifteen minutes I returned to the planet feeling oddly refreshed and energized, and only a little woozy. One workshop participant happily reported that she'd had "a great idea for a business" during her short ride. Inventor-manufacturer-promoter David Graham recommends using it for an hour at a time, and says 10 sessions will produce permanent change. My fifteen minute trip on this machine was

leave your body). He's also one of the pioneers in the use of sound to induce altered states. His institute sells a wide variety of tapes intended to synchronize the brain hemispheres and resonate the brain at frequencies that aid relaxation, concentration, memory and so forth. Too bad they don't sell the ones they use to induce out-of-body experiences.

The Hemi Sync synthesizer (about \$350) is their most interesting product. When hooked to a stereo system it generates many different frequencies and combinations for many different results. For instance, high beta, plus theta, produces a relaxed alertness conducive to learning. The tones are usually played along with music — but somewhat quieter, which makes them inaudible but supposedly no less effective.

MIND MACHINES: SUMMER '88 UPDATE

The mind machine field is peopled with prickly individualists. Some are flamboyant and some are low key. Some are dedicated researchers and some are dedicated hustlers. Obviously, the internal squabbling is another story which we can only hint at here. Like an oil or mining strike, the hapless innovator is sometimes stampeded by a wave of eager entrepreneurs. In the case of Denis Gorges, though, he seems to hold all the chips. He not only staked the first claim (patent # 4,315, 502 way back in 1976) but he supposedly sewed up every conceivable permutation on a machine using light, sound and electromagnetics in a "harmonically coordinated" way. He also developed a degree of cordiality with the Feds that make other people wonder, though some insist that he merely plays the game their way.

There are 150 Synchro-Energizer centers going up in the Middle East, mostly on military bases. The Kuwaiti government is buying them up, as is the Rajneesh Puram in Poona, India. The Cadillac of the system is the 4X IBM PC-AT Expansion System which accommodates 1-150 persons and costs a basic \$10,000 plus \$1,500 for each additional set-up. Then there's the Walkman-sized model 5 for one person with 10 pre-sets for \$499 and the model 6 — about the size of the average hardcover book which includes 16 pre-sets, a tape recorder and digital readouts for \$1499.

Gorges is vocal about the need for establishing industry standards now, and seems reconciled to losing his king of the mountain monopoly over the rapidly burgeoning field. He is concerned though that many of the other machines are not "brain friendly" — and that some may be downright dangerous. Machines that allow the user to twiddle his own dials should be used only under the close supervision of trained clinicians, Gorges maintains. Amateurs should content themselves with pre-set programs — all of which sounds rather boring to the intrepid psychonaut. (Who knows when you might stumble on that magic concatenation of frequencies that'll open up your third eye?) Then those frequencies and pulsations have to be harmonically co-ordinated with each other in order not to introduce any subtle dissonances. Every time you tune the frequency, you have to adjust everything else. Many machines on the market lack the electromagnetics, having only light and sound, and most have red light-emitting diodes. These flashing red lights could effectively countermand the stress reduction by producing a deeply ingrained fight-or-flight response.

Gorges is known to have blown the whistle on many competitors and supports the Waxman Bill. Senator Waxman has proposed a bill that will outlaw all machines that purport to change behavior or have therapeutic applications unless they conform to regulatory guidelines and remain subject to review. Any other device may be sold for "entertainment purposes only". It is claimed that Gorges bullies and threatens his competitors and his flaming ego has not endeared him to some people. In fact, he has alienated just about everyone with his accusations of patent infringement. Yet many of these machines, like the Tranquilite and the Graham Potentializer, lie completely outside the Synchro-Energizer configuration.

Some of Gorges' points though seem well taken: he emphasizes the need for "dynamic" stimulation and constantly refers to the findings reported in Robert Becker's book *The Body Electric*. Candace Pert and Marian Diamond reported that enriched environments caused brain growth but non-dynamic stimulation (i.e.: narrow band environments) — was stultifying. The Synchro-Energizer features a constantly cycling random generator producing brain friendly frequencies.

Denis Gorges' strongest ally and future hope lies in Ron Logsdon, a brilliant young (32 year old) electrical engineer and former machinist with a background in hypnotherapy and accelerated super learning techniques. He designed video games for Milton Bradley before he hooked up with Larry Gillen and Linnea Reid of "Light and Sound Technologies" and designed the MC². What he brought to the industry was

the concept of a single chip micro computer. There are 3 chips inside the MC² instead of the 50 inside the Synchro-Energizer. Eventually an ethical gulf opened up between Ron and Larry and Linnea, and they parted company 'midst a good deal of acrimony. Larry and Linnea were left with the rudimentary MC² while he kept all the software which was still at the drafting board stage. In joining up with Gorges, he plans to extend the dynamics of the basic MC² and open up its software capabilities. He and Gorges are also inviting purchasers of the MC² to send them in for "retrofitting" for circa \$60. With his background in hypnosis, we felt moved to ask him about the insidious dangers of entrainment. Logsdon believes that "conscious override" of "frequency following response" will preclude these machines being used for mind control just as the hypnotic subject will refuse to follow commands that are morally repugnant to him. Logsdon's chief fascination is in using these devices for superlearning — amplifying conditions that make for true learning and vastly accelerating it.

Soap opera and hugger-mugger aside, we called up Michael Hutchison to see what else was popping in the industry since *MegaBrain* first came out. The two machines he has added to his repertoire that most intrigue him are the "Photron" and the "NeMO".

The Photron is a neurophotonic stimulator developed by Dr. John Downing of Novato. It consists of a strobe with a full spectrum light focussed into the eyes with pure color filters. Each color is used at a the optimal frequency for different conditions and can be tailored to the user: pure red at 15 Hz. [beta range], say, or violet at 7 Hz. [theta range]. This has a direct stimulatory effect on the brain via the hypothalamic route, and he reports remarkable effects on hearing, eyesight, allergies and depression. He has amassed over 300 case histories, some of whom are interviewed in a 10 minute videotape. There are 50 Photrons currently in use at a cost of \$7,000 each.

The NeMO stands for "Neuro Muscular Organizer" and shares much in common with the Graham Potentializer. It was developed in the 60's by two engineers working on the Apollo Program. Dr. Larry Shultz, a chiropractor in L.A. has used it for a wide range of conditions including the treatment of stroke victims. A Zen master who became enamored of it has called it "mechanical Tai Chi". Like the Graham Potentializer, its movement stimulates the vestibular system of the user, only instead of being horizontal, he remains upright at a 6 to 18" angle with hand grids, and is rotated 4 times a minute through this tilt. EEG tests performed with the Graham Potentializer showed that this kind of motion stimulated the NEQ or neuro efficiency quotient. The enhanced brain function is thought to derive from vestibular stimulation of the cerebellum which in turn stimulates the septal region of the limbic area of the brain. This is the area which long ago John Olds identified with pleasure states. More recently Robert Heath at Tulane has correlated stimulation of these areas with learning enhancement.

Megabrain Workshops were the subject of an article in the September '87 issue of *Success* magazine, and a synchroenergizer parlor — "Less Stress" — has recently opened up in the heart of San Francisco's Financial District. What does all of this portend? Michael Hutchison will share some candid views and prognostications in our next issue. Meanwhile he continues his breakneck pace with Megabrain workshops — about 60 in the last six months — and invites readers to call the new Megabrain National Headquarters in San Jose at (408) 279-4392.

--- Queen Mu

I've spent some time with Monroe tapes said to aid concentration and memory, but can't say I've noticed any results. Hutchison had a

Hemi Sync synthesizer playing those relaxed-but-alert frequencies under the New Age music that preceeded the workshop, but again it was

hard for me to discern an effect. I did feel relaxed, but that could have been due to the music alone. I was alert, but I was also eagerly awaiting the start of the seminar. My brain waves didn't feel synchronized, but I probably wouldn't know it if they were.

The Tranquilite

A device not yet in production, it uses goggles containing a curved electroluminescent panel that shines a smooth, soothing, pale blue tone across the user's entire visual field. This featureless light is called a *ganzfeld*, or homogenized field. It's the visual equivalent of pink noise the Tranquilite generates and sends through its headphones, and the combination makes it a sort of portable floatation tank. I was able to try it long enough to confirm its relaxing effects, but fifteen minutes wasn't enough to reach any of the more interesting states reported by floaters.

The SEE (Reflection Chamber)

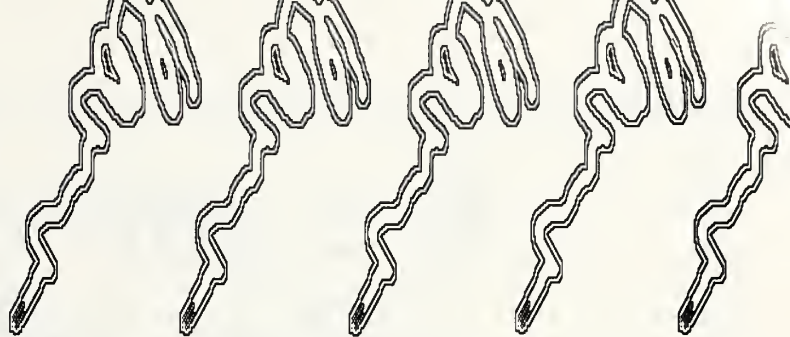
Not an active mind machine, the SEE consists of a mirrored box in which one sits and meditates with eyes open. Inside is an adjustable fluorescent light which, at lower levels, produces an annoying buzz. I stared at one life-sized reflection of myself, and hundreds of smaller ones, for twenty minutes. I felt by turns puzzled, intrigued, happy, silly and bored as I ruminated on my appearance and self-image. I emerged feeling slightly more at ease with myself, but I suspect staring into a single mirror for that long would have produced the same result.

The Somatron

Imagine a massage table with a high-powered car stereo system built into it. True, it's a new way to really *feel* music, but I didn't find it particularly enlightening, and besides, your downstairs neighbors will hate it.

Some Final Electro-Thoughts

My experiences (and the general consensus of participants) were that the noticeable



short-term mental effects of the machines were proportional to their complexity and price. The favorites were the \$1,000-7,000 hot rods. Informal polling showed the Graham Potentializer, the Synchro-Energizer, and the D.A.V.I.D. 1 as "Best of Show." No one had a chance to try combinations of machines, which Hutchison says can have striking synergistic effects. He particularly recommends trying the Graham Potentializer with Hemi Sync tapes and either Synchro-Energizer or the Tranquilite. That would be powerful, indeed. How about adding an Alpha Stim set for endorphin release? The mind boggles.

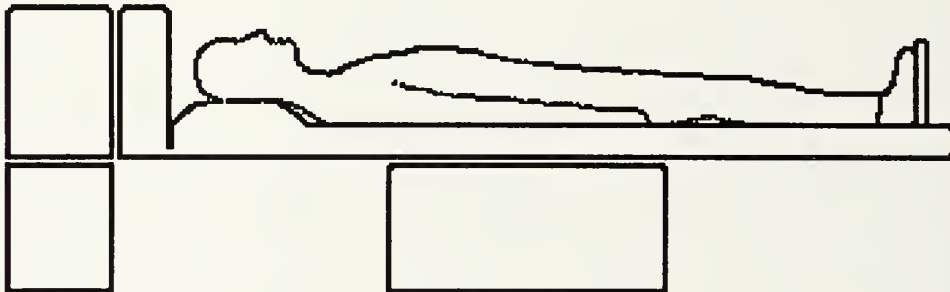
What about the new Waxman Bill, fueled by technophobic no-fun conservative sticks-in-the-mud? A climate of restraint reigns currently in the mind-machine field lest the government take away some of the best new toys humans have had in ages. The lengthy release the workshops had to sign seemed a little absurd, until I realized it was designed to shield the promoters from another of today's plagues: a herd of charging lawyers on the scent of a big settlement.

The momentum continues to build. More and more researchers and manufacturers know they're on to something big and won't give up without a struggle. More people are trying mind machines, and the technology will continue to get cheaper. I know of one pair of hackers who've built a pair of flashing-light goggles that plug into an RS-232 computer port, and are writing some very flexible Macintosh and IBM software to run them. They hope to give computer owners more visual stimulating power than a Synchro-Energizer for under \$400.

It will go beyond that, too. I predict that at some point the Japanese electronics giants will take notice, and then we'll have \$149 Sony Relaxmans and who knows what else. I can hardly wait.

$$E = mc^2 \quad \lambda = kf$$

*You know the first equation:
Come and experience the second . . .*
THE GRAHAM POTENTIALIZER



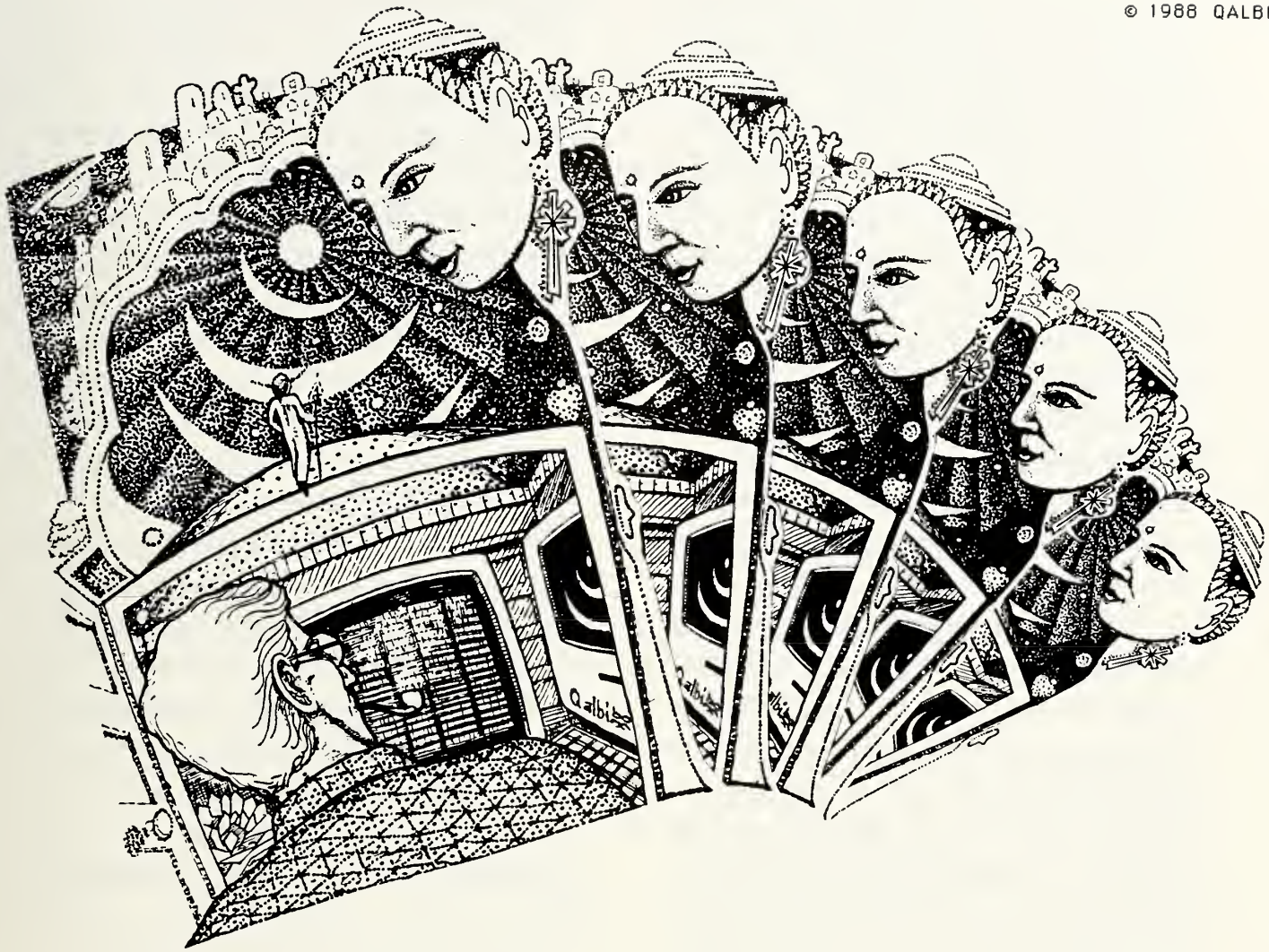
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ARTIFICIAL REALITY TECHNOLOGY

Timothy Leary & Eric Gullichsen

The following sections are excerpted from a rough draft of THE CYBERNAUTS: From Modern Alchemy to the New Renaissance by Timothy Leary and Eric Gullichsen, which one might describe as a potent blend of popularization of the latest advances in computer

technology with the magick of Crowley and teachings of Gurdjieff. The book will be published by Falcon Press, Autumn, '88.

Humankind's post-industrial cyber-era is characterized by a dissolution of the relevance of what has up until now been regarded as the

“real world”. It has been termed real because it has been the one and only physical universe whose existence is known -- that which has had a monopoly on stimulation of the inputs of human sensory organs.

Artists from the earliest times have striven to create alternate realities, stimulations of other human's senses with signals created by humans in an act distinguished by its quality of self-awareness and intention from those of the non-human natural world. “Art” and “artificial” share etymological origins in the Latin “ars”, meaning “craft”.

Improvements in technology have contributed to the increasing sensory completeness of the artificial. Whereas traditional art forms, music or sculpture, typically appealed to a single sensory channel or at most a few, now forms are sensorily encompassing. From the invention of the movie, to the construction of shopping malls, humans have had an increasing choice of alternative experiences. Shopping malls have grown to the extent that they are places where people can be born, live, get married and die.

However, neither traditional art nor architectural artificial realities modify the rules of operation of the perceived universe; they simply modify visual or spatial properties locally. The key difference in computer-generated artificial realities is that their rules of operation -- the laws governing change through time, the rules of the game --- are as mutable as their immediate form. Secondly, they can be more interactive, most responsive to improvised interplay with

humans at arbitrarily fine levels of detail.

The construction of artificial realities involves the reification of the concept expressed by iconoclastic computer visionary and aristocrat Ted Nelson (*Computer Lib, Dream Machines*) as “virtuality”: the “feel” or “seeming” of something. Virtuality is contrasted with functionality, the pragmatic side of an act or artifact. Automobiles are all basically identical in functionality, but a Ferrari and a Volkswagen differ greatly in virtuality.

We speak here not of the rather prosaic applications of computers as design aids for architectural drafting and inspection of the 3-D form of buildings not yet built, but of dynamically-reconfigurable architecture realized by computer-projected holograms.

A CYBER PRANK IN ARTIFICIAL REALITIES

Computer scientist Randy Smith at the Xerox Palo Alto Research Center has built a computer system for educational play in an artificial physics reality. With his system, called *ARK*, for “*artificial reality kit*”, players can create objects with properties such as motion, acceleration, and gravitation. Through computer animation, the objects move continuously in accordance with the laws established for the artificial reality, orbiting one another and bouncing off the perimeter of the screen. It is a virtual laboratory for learning through experimentation, reflecting the intelligent use of a computer as something capable of far more than the reproduction of the properties of

a static traditional knowledge medium such as paper.

When objects are dragged with the mouse between alternative artificial realities within the system, they cast a shadow as if lifted out of one reality into the third dimension. Properties are attached to objects by dragging a button to the object. Ingeniously, if the property is inappropriate to the object, the button fails to "stick," falling to the bottom of the display screen.

One now-legendary story about the delightful Dr. Smith and his elegant cyber pranking is as follows: Xerox PARC is equipped with a realtime video link from Palo Alto to a Xerox site in Oregon. With cameras, sound systems, and display equipment at both sites continuously transmitting and receiving, the link is a virtual corridor a thousand miles long, one end of it in each state and the middle of it in cyberspace.

One day, Smith was giving a demo of his system to some people at PARC over the video link. That is, the audience was in Palo Alto, watching him demon-

strate on the screen from Oregon. Concluding his demo, Smith produces a metallic button-like object resembling the buttons in the interface of ARK, labelled "teleport." He positions it in front of his chest, and presses it with his other hand. Instantly, he vanishes from the screen and the button clatters to the chair where he was sitting a moment before. A second later, he appears, live, in front of the stunned audience in Palo Alto.

As a prank involving a simple video effect and a masterful manipulation of human expectation, it was supreme.

NASA EXPERIMENTS: SCOTT FISHER'S VIRTUAL ENVIRONMENTS

The most complete integration of technology towards the realization of encompassing telepresence artificial realities has been completed by the Aerospace Human Factors Research Division at NASA's Ames Research Center, under the direction of Scott Fisher.

Fisher has assembled a system capable of presenting an integrated sensory



environment, with a helmet-mounted liquid crystal visual display presenting a scene which changes appropriately through the tracking of the participant's head position. Three-dimensional sound generation equipment presents sounds through headphones in a manner which seems to localize the source of the sound in space.

Visceral interaction with the artificial environment is made possible though use of speech and gesture input devices. Commercial devices, capable of understanding continuous speech, listen to the wishes of the participant, and prototype VPL gloves track the position and gesture of both hands to permit interaction with the virtual objects.

There are several obvious and immediate applications for this technology. The very practical capability of telepresence permits humans to function in remote places or environmentally hostile conditions without endangering their fragile envelopes of flesh. Humans need not be sent into the vacuum of space or the eye of the battlefield, except virtually.

The ability to overlay the presentation of computer-filtered information on top of real world local or telepresence video displays enhances the ability of humans to function in information-rich environments. It is a well-known fact of psychological research that people tend to be able to cope with only 7, plus or minus 2, independent entities in their field of attention at any one time. By having a computer manage the complexity of the real world, applying hierarchical organization as appropriate to remain

within these common cognitive limits, more complex environments can be managed within the human's ability

THE ARTIFICIAL REALITY OF MYRON KRUEGAR

Artificial Realities are not the monopoly of Big Science. The term "artificial reality" (in the singular) was coined by the artist Myron Kruegar whose experiments were presented in a book of the same title. Kruegar dealt with Artificial Realities as a new medium for performance art. Although simple, they are compelling.

In *Videoplace*, a computer projected silhouette tracked faithfully the movements of the participant. Interacting with the silhouette were computer-generated sprites resembling some form of insect. In one variant of play, the insect continuously attempted to perch on the participant's head. Only by continuous furtive movement could the participant prevent the sprite from landing.

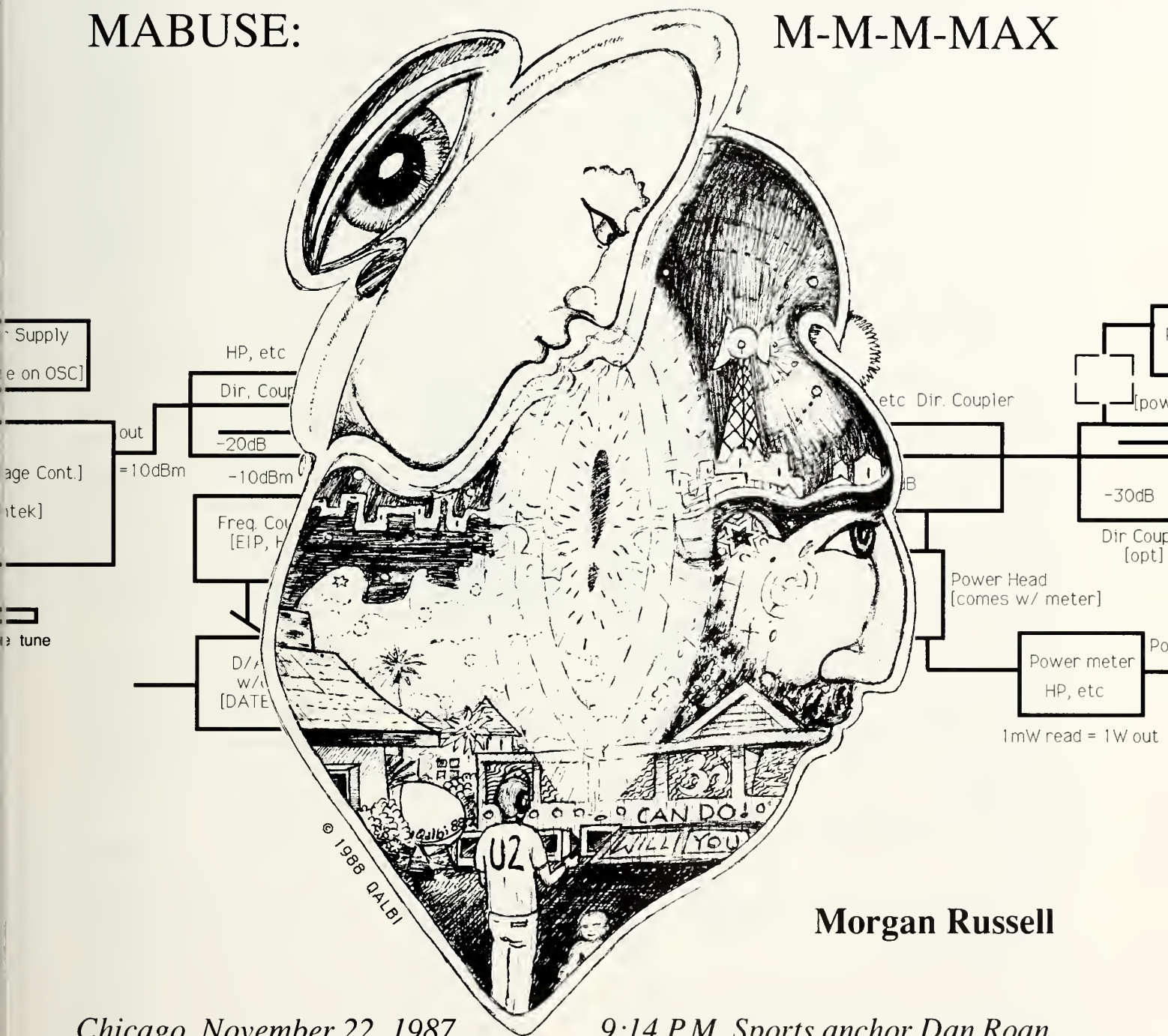
POPULARIZATION

Many new technologies are being created to permit the exploration of Artificial Realities, rich uncharted new domains. A remarkable fact is that the components for their widespread popularization exists today, the dissemination awaiting entrepreneurial skill capable of overcoming societal inertia.

The technology is both quantum and cyber. Quantum in its basis on digital communication and computation, cyber in its ability to empower the individual to lead an autonomous yet interacting life of increasing choice.

DOKTOR MABUSE:

HACKER TO THE M-M-M-MAX



Morgan Russell

*Chicago, November 22, 1987
9 P.M. Viewers tune into WGN TV's
Nightly News for the accustomed
broadcast reports from the world-at-
large. A mysterious TV pirate is, at
the same time, aiming a microwave
antenna at WGN's STL (Studio to
Transmitter Link) preparing to
overpower the station's signal.*

*9:14 P.M. Sports anchor Dan Roan
is interrupted in mid-report by the f-
f-f-figure of Max Headroom who re-
mains on-air for 25 seconds before
WGN switches to its backup STL fre-
quency.*

*11:10 P.M. The pirate overpowers
WTTW TV's signal going to their
STL on the Sears Tower. For one*

minute twenty-eight seconds Max broadcasts his message over one of the largest population centers in the United States, including comments about a WGN radio and TV sports announcer, and displaying someone's bare ass being hit with a fly swatter. WTTW loses control of its transmitter entirely and is powerless to shut it down.

Berkeley, March 31

Phone conversation between Morgan Russell and famed hacker/cracker "Deep Tokes":

Morgan Russell: "What do you think of the comments in *Television Broadcast* [leading broadcast journal] that 'millions of Americans who rely solely on TV for news and information might be easy prey for manipulation,' that it's 'a potential threat to national security,' and that 'our very society would be disrupted? . . .'"

Mystery Caller: "I'd say stations should just belly up to the bar and order some fiber-optic cable for security and get reasonable bandwidth into the bargain," says an adenoid-afflicted voice not belonging to my interlocutor.

"Someone there with you, Deep Tokes?"

"So sorry to break in, but your line was busy and my time here is short. I don't access REMOB [remote observation] unless I'm pressed for time."

"Uh, Morgan," Deep Tokes interjects nervously, "I've got ta workout scheduled. Gotta go." Click.

"Didn't mean to break anything up... " the interloper drawls.

"Who is this?"

"Let's just say an 'Interested Observer.' Your newsletter is amusing, but it's a bit wimpy in the data department. You need a little hard data . . . a technological hormone injection . . ." I break into the Interested Observer's languid simpering air, "we'll see who needs a hormone injection."

"Temper, temper, dearie. Listen, we must do lunch. If you want to know about Max, I'm the one to talk to."

"Well, . . ." I hesitate.

"Meet me at the Durant at one. I'll be wear-

ing a green carnation."

I sit in a neo-roccoco sidechair in the hotel lobby. I become aware of a presence at my side. A tall spare figure with black hair parted down the middle, expensive but slightly worn-looking jacket and trousers, paisley foulard, alligator boots, dark glasses with side-baffles, and a slavering distinctly wolf-like dog with elaborate harness dripping saliva on my Reeboks.

"No, no, don't get up," he says in a deep resonant voice, the adenoids suddenly gone. Had you going, didn't I?"

"How'd you know who I was? "

"You're the most confused-looking gent in the place."

"You mean you're not . . ." I gesture toward my eyes.

"Oh, Lord, no. This is the only way I can get my dog into restaurants. The third time he ripped the interior out of my Bentley, I knew he was trying to tell me something. Have you ever tried to get fang marks out of burl? Do you realize how much Connolly hides go for these days?"

"Quite."

"Wretched beast tried to mount the doorman on the way in, all I could do to pull him off... " He trails off as he peers through his nearly-opaque spectacles at a pocket-watch he's extracted from his waistcoat. "Time we go in."

"And the act on the phone?"

"Just a test of your Ernestness." He starts bobbing and weaving on the way to our table, "Take a walk on the Wilde side. And the colored girls sing: *doot-deedoot-deedoot-deedoot-deedoot*" as the canine beast lunges at a patron being served a salmon. "Heel, Hitler! Heel, damn you!" I trail behind groaning and pulling my jacket tightly against my neck like a cloak of invisibility.

At our table Hitler circumambulates the central table support precisely seven times and settles to the floor with a discernible thud. The yuppies at surrounding tables look on with strained nonchalance as Hitler lubes his distended engine of procreation.

"Do put that away. Thank you, Hitler," with an accompanying prod from a scuffed alligator

boot.

"You seem to know who I am, but what should I call you?"

"You can call me ..." he muses thoughtfully while surveying the wine list with thinly veiled disdain, "ah, yes . . . why not simply call me *Doktor Mabuse*."

Three orders of fried calamari arrive and the rest of our conversation is punctuated with staccato snaps and greasy gulps as Herr Doktor flips bits into Hitler's yawning maw.

"Tell me, Doktor, how does a TV pirate like the Max Headroom clone take over a station?"

"Very simply. Max Headclone isn't a model pirate, though. Certainly he's an RF technician, possibly on the payroll of a fiber-optic company trying to drum up business, but his job was amateurish in certain respects: his broadcast on WGN had no sound because he wasn't using the proper audio subcarrier; he wasn't able to switch STL frequencies when WGN did twenty-five seconds into the broadcast; and his broadcast on WTTW was so brief that a viewer who went to the bathroom or the fridge for an *instant* would have missed his slot *entirely*. If it's not listed in TV Guide, it has to be long enough to *attack* people who are channel-switching. And there's no indication that he knew the remote-control protocol to take *complete* control of the transmitter."

"Well, how would a savvier pirate do it?"

"This is what I'd tell her: Catch the sign-off of the desired station. They're always bragging how tall their transmitter is on the *tallest* building or the *highest* peak, and they give their studio location so you can *contact* them about it, so she'll merely need to find a hotel in between

these two sites in the cone of reception of the transmitter antenna. She can obtain frequency information from her friendly neighborhood FCC field office or gather complete information by putting a spectrum-analyzer in the line of the signal and looking closely at what's being sent out, de-modulating it, and doing another spectrum-analysis of that to determine the baseband."

"Spectrum-analysis?"

"Hm, seems I'm going to have to be somewhat *basic* about this," he said pronouncing "basic" with an expression which most people reserve for a bad oyster. "Let's do this right, then. O, Miss!," he shouts to the waiter who's been ignoring us.

"Sir!," the waiter fairly spits in basso profundo.

"Nasty cold you have. Mind you don't breathe on me. I need a napkin."

Doktor Mabuse takes the linen napkin from the hands of the apoplectic waiter only after reaching out blindly and pawing the entire front side of his uniform. As the waiter hastily retreats, Doktor Mabuse deftly unfolds the napkin on the table

between us, takes out a vintage Waterman and, with a lightning hand, sketches a diagram as he talks. "A spectrum-analyser is a very fancy CRT display which costs five-to-twenty thousand dollars. Five hundred to two thousand dollars to rent one for a month. Generally speaking, a monthly rental on any of this equipment is about a tenth the purchase price. But I digress. Some have digital displays and all manner of bells and whistles. Hewlett-Packard makes a particularly fine one. Simpler spectrum-analyzers are in the two-to-five thousand dollar range. The spectrum



This unofficial Max headroom character was a guest on two recent Chicago broadcasts.

Fake Max disrupts points out vulnera

By Phil [unclear]

CHICAGO—While
tors continue their search for the
Max Headroom impostor who
disrupted transmissions from
two Chicago television stations,
the broader implications of the
incident are only beginning to
surface and be examined.

Among those issues are public
access to STL frequency in-
formation, STL security, remote
transmitter control requirements,
and even the potential threat to
national security.

Specifically, if the Max im-
postor encouraged a spree of
copycat incidents, millions of
Americans who rely solely on

microwav
WGN's ST
the Hanco
the frequ
San Ro
mid-rep



Uncle St. Nunzio

analyzer can be used as a frequency measuring device with accuracy down to a megahertz or so, which is probably close enough.

"A normal Beta or VHS jitters too much to be acceptable for broadcast. It may prevent operation of the STL if the STL is equipped with a mechanism which shuts itself down in the absence of a stable signal. Super VHS with a time-base corrector would yield broadcastable quality. Some transmitters, however, are equipped with a time-base corrector, in which case she can send any kind of signal. The audio requires seventy-five microseconds pre-emphasis to shape the frequency response of the base-band.

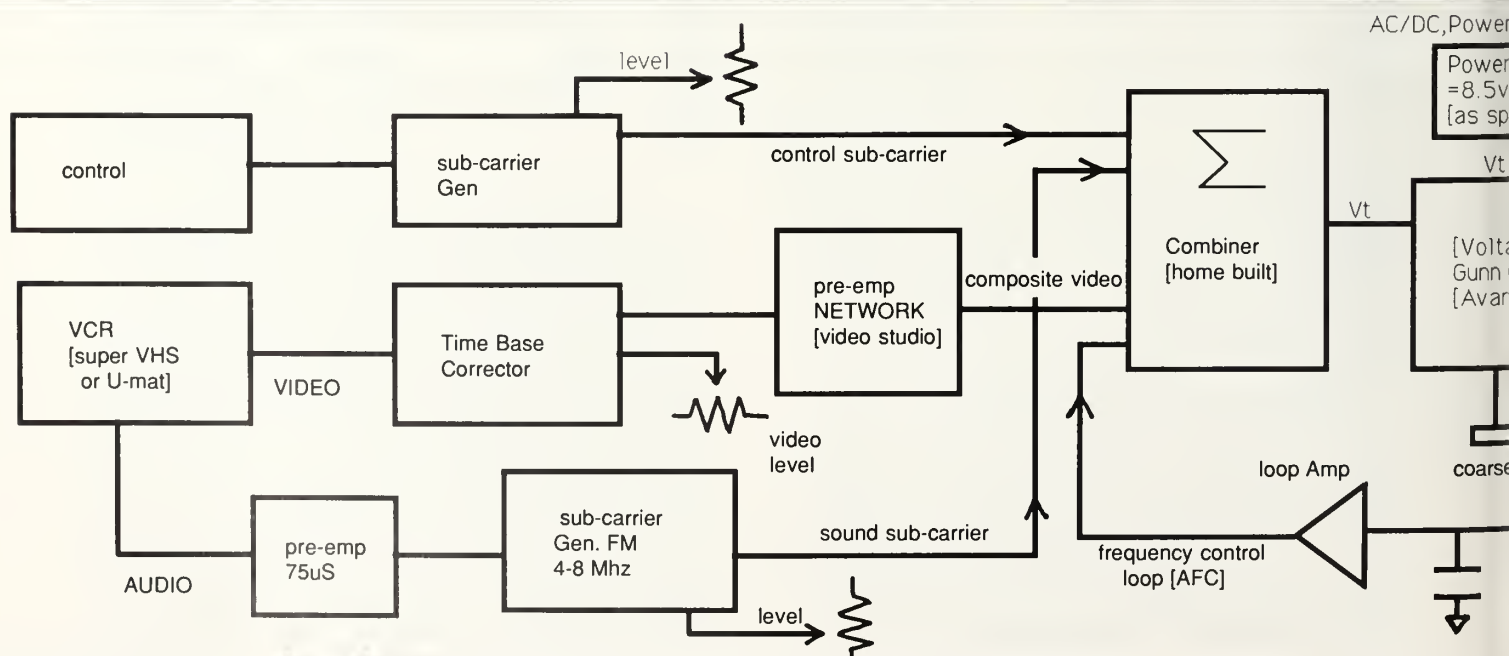
"Our pirate can derive the remote-control protocol by first determining the brand of STL the station uses. TV stations allow the public to view their facilities at least once a year when they have open-houses. She can note the brand they use, for example, Mosely. She could also just call the station and ask for the Chief Engineer. These techie-types just love to discuss what they do and are usually most willing to give a run-down of their equipment to anyone who's interested and sounds halfway plausible. Anyone in college with a class assignment, for example. She might also go to the NAB (National Association of Broadcasters) convention —

there's one coming up soon in Vegas. She could strike up a conversation at an STL manufacturer's booth and learn what format they use and obtain a list of stations which use their equipment. The technical or service manuals will indicate what frequencies subcarrier generators operate at, what the deviation is, and what the level on the composite is. She might also analyze what's on the control-channel, though they use very high-speed signals which can be tricky to follow.

"The station may have a Telco link controlling the transmitter. This is a much more secure arrangement. If our pirate can obtain the access and control codes, she can turn the transmitter on and off, raise and lower its power, hear sounds around the transmitter site, and get readings through a speech synthesizer of the plate-current, output power, and plate voltage, all with a touch-tone phone. She could, of course, just turn the transmitter off and leave her phone off the hook to wipe out transmission entirely until someone drives to the transmitter site and physically turns it back on.

"Scanning the code is difficult. It has eight digits with twelve possibilities for each and unsuccessful tries at the code are noted.

"She needs a stable oscillator that can be frequency-modulated with several signals at once:



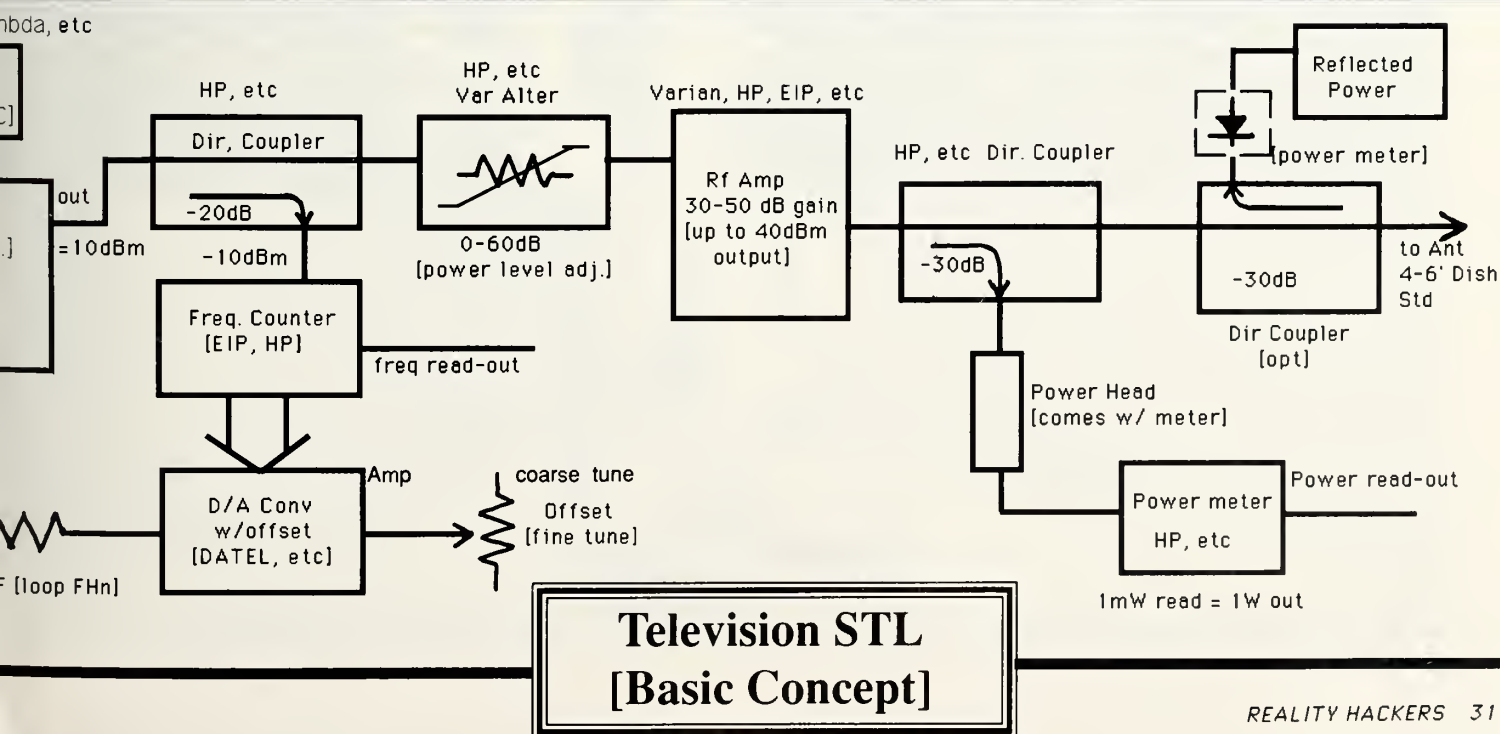
the composite video (video and color information), the sound information, and special sub-carriers to activate the STL. She can use a VCO (Voltage-Controlled Oscillator), or something which can be modulated like one, as the basic source of the signal. A Gunn-oscillator unit, like an AvanteK, would operate the proper frequency band. The voltage-control input allows her to frequency-modulate. She applies the voltage stated on the unit, for instance, eight-and-a-half volts. It takes about an amp to start and puts out approximately ten milliwatts. An attenuator must be put between the VCO and the power amplifier to keep the signal from overloading the amplifier. It should be adjustable so she can give it just enough power to do the job. She should use attenuator-pads with her power meter. The power heads can only take one hundred milliwatts and she'd want to measure up to ten watts.

"The Gunn oscillator has a fairly thick screw which alters the volume of the cavity into which it moves, thereby altering the frequency. Many have a little varactor diode which is a Voltage Variable Capacitor Diode with a little loop of wire attached. Varying the voltage across this diode varies the frequency only slightly, but enough to modulate it.

"The 20 dB directional coupler I show could

just as well be a 30 dB unit if the counter is sensitive enough. This is the tap-off off the oscillator to monitor the frequency," Herr Doktor indicates with a golden nib. "The frequency counter or the frequency measuring device must have a constant level.

"A microwave frequency counter is a device that can actually count and measure the frequency coming out of the antenna, the VCO, or the amplifier. She can use the counter to adjust the input of the VCO. It acts as a digital AFC which holds the frequency on. A microwave frequency counter costs about five thousand dollars, but there are enough around so one could probably be borrowed for the night. Cheaper frequency-control methods could also be used. A ten-foot length of coax with a line-stretcher, and an R.F. mixer would form a fairly good discriminator or FM detector and is tunable. (Insert diagram) It would be a multiple-wavelength piece that would go through a zero-point twice every hundred megahertz. She'd adjust the length with a line-stretcher to get on the right zero-point. Other ways of stabilizing it are static-locking or phase-locking it with a crystal, then a frequency multiplier having an output that is filtered for the desired frequency, comparing the two frequencies and keeping them close. If the device is stable enough, she might be able to use





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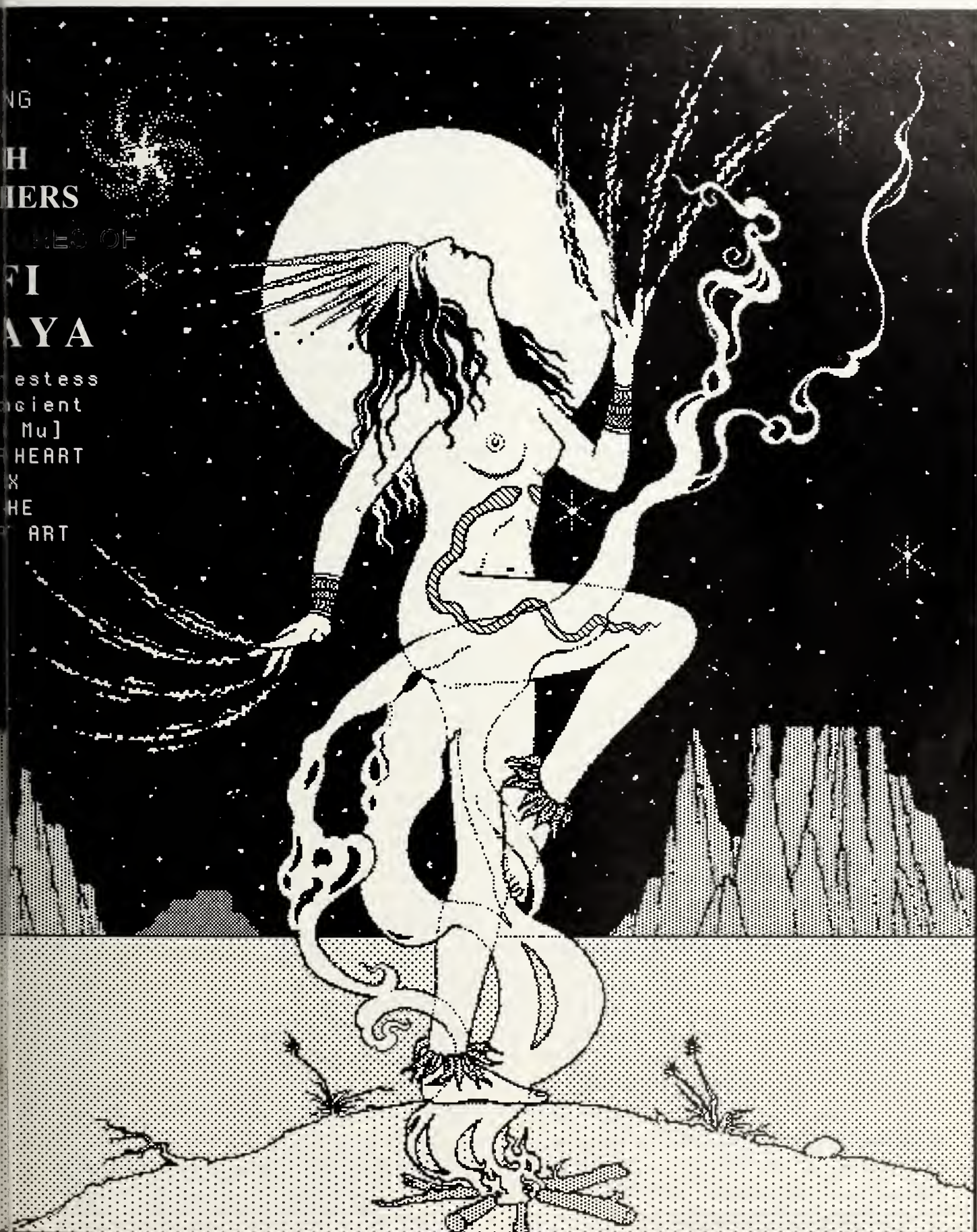
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it 'as is' for a quickie. It wouldn't drift much in a couple of minutes."

"How could she avoid getting cut off the air if the station switches its STL frequency on her?"

"Most TV stations have at least two STL frequencies and can switch from one to another. I've diagrammed a set-up here with a frequency counter and D/A [Digital-to-analog] converter with offset. The D/A with offset takes the number from the frequency counter and converts it to analog for the frequency control loop. She could have a digital control here and set the frequency she wants. This counter could be locked-onto and would then automatically pull the oscillator into the right frequency. If the station flipped to another frequency on the same band, her broadcast would simply flip frequencies synchronously. If the alternate frequency were on another band, she'd need an additional frequency control loop to have the capacity to flip frequencies along with the TV station.

"A travelling-wave tube is probably the most available RF amplifier, but GaAs FET (Gallium Arsenide Field Effect Transistor) - type amplifiers may also be available. It would have to be a clean amplifier, preferably linear, so the output power is readily adjustable. She'd select the power capability of the amplifier depending on the type of antenna used and the distance from the transmitter. She needs only twice the paltry amount of power the studio puts out. In the typical set-up, the station sends half-a-watt into a four-foot dish. If she's halfway between the station and the transmitter, a quarter-watt would overpower the signal. Every time she halves the distance to the transmitter, she needs only a quarter the power. If she overloads the STL receiver, however, the transmission quality is degraded or the receiver shuts down. STLs are as finicky about a signal as pampered Persians are about a proffered hors d'oeuvre.

"Finally, our pirate needs to tune her antenna by taking a reflected-power reading. Ideally she'd want a hundredth part of the power returning. That would be a good match. Once she's tuned it she can then just monitor the forward power as she broadcasts.

"A satellite uplink is very much the same basic idea as this set-up except the power-end of it is much greater. One would want to be able to vary one's power from fifty to five hundred watts into a twenty-four foot dish. A large dish is highly detectable, but if twenty people banded together, each with her backyard dish and a ten-watt amplifier sending frequencies precisely locked to come into phase at the same satellite, the regular satellite uplink would be overridden and there would be no good way to determine where the signal was coming from. The technical expertise required is considerable, but don't underestimate the ingenuity and rebellious spirit of all the independent cusses who bought satellite dishes, some at very great expense, to receive *all* the satellite signals, only to have some of them scrambled in an attempt by the broadcaster to sell descramblers and charge monthly fees for the dubious privilege of watching TV."

Doktor Mabuse consults his pocket watch from whose chain clatter various amulets: Burmese protective tokens, a gilt cigar clipper and a tiny compass. "I must be shoving off. I have a tutorial with some of my young charges. Gifted hackers — half of them women." He pays the tab as Hitler sprays the Aspidistra, and we all troop out to the curb. Opening the boot of his Bentley, "It's an elite corps I advise. Less fevered group than most. They don't need to sublimate and reroute *all* their burbling teenage juices. Experienced hands, all."

He pulls a long tool from the luggage compartment, walks round to the front of his motor-car, inserts it under the radiator shell, and gives it a crisp crank coaxing the car to life. "Bloody battery ran down in storage. And the bat guano! . . . filthy vehicle when I fetched it." He deposits the crank in the boot, Hitler in the back seat, and himself behind the wheel. "Oh, yes. Here." He picks up a package from the seat beside him and hands it to me. A Co-op shopping bag with a cardboard box inside. "A scrambler device matching the unit I'll use when I next contact you."

"But how does it work?"

"Dear Morgan," he sighs with taxed patience.
"When all else fails, *read* the instructions."

I blush scarlet and shuffle with embarrassment.

"Must be off now," he says breezily. "Ciao!"
He pulls away from the curb swerving slightly to miss a local mendicant, and I watch him disappear down College Avenue amid the echoing cries, "Down, Hitler! Down, mangy beast!"

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FEED YOUR HEAD:

Now! Psychoactive Designer Foods!

Durk Pearson & Sandy Shaw

interviewed by Judith Milhon



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*We've been on the phone with Durk and Sandy, researchers for the heightened, as well as the lengthened, life, for nearly half an hour. All the way from L.A., they're live'r than we'll **ever** be. Their voices: they superball out of the line and knock us flat. And the data ---- volleys carom around and bounce upon flattened editorial us like killer tomatoes. D. and S. are trying to tell us how what they call "natural wimps" can be transformed.*

*We **need** this information.*

Sandy is gruff: What we've done is develop a number of psychotropic drinks; and these are all natural, all nutrients — no drugs in them — and yet they have very powerful mood-altering effects in the brain.

Durk is hearty, rapid-fire: Remember that people's moods and all their emo-

tions are simply controlled by the biochemistry of the limbic system. Whether you're a snake, or a shark, or a human being, you have the same neurotransmitters which produce the same results. What we're doing is manipulating the levels of two of the most important neurotransmitters: noradrenalin (the brain's version of adrenalin) and serotonin.

Sandy, aggressively: We've found that you can turn somebody who is a natural wimp into a *leader*. See, if you don't have enough noradrenalin, you don't have that aggressive drive you need to be an effective leader. You can't be assertive, and you're just not gonna *make* it that way.

Durk, triumphant: And you won't have any ambition; you won't *want* to be a leader.

Sandy: Exactly. So, by taking phenylalanine and the co-factors that the brain needs to make it into noradrenalin. . .

Durk: . . . that is, carbohydrate, B⁶, zinc, folate, copper and vitamin C . . .

Sandy: . . . and adding some natural fruit flavors, some natural food acids, we've made a really terrific drink! You drink this in the morning, it gives you a fantastic amount of energy and get-up-and-go; it's fantastic for jet lag. You might be naturally laid back and easy to push around and you can be turned into somebody who can really go out there and *take over*!

Reality Hackers, assertively: *Hey! This sounds like the stuff! What do you call this?*

Durk: This is our Rise and Shine formula. But there's more to being a leader than sheer aggressiveness. It's been found that leaders of baboon tribes and organizations like Rotary or Kiwanis have high levels of *serotonin* as well. Because the leader who just engages in violence is gonna destroy the band they're leading.

RH: *They've gotta be cool as well as . . .*

Durk: *Right !* They have to be cool *and* assertive. So, you can use *both* the Rise and Shine and our Serene formula drink, for the get-up-and-go and the restraint to use it appropriately.

Sandy: You can take any of our designer foods together. They're designed not to interfere with each other. There's also our growth hormone-releaser, Power Maker (I'll get into the sexual effects of that in a moment), and our Energy Cycle drink.

Sandy: We can turn a natural wimp into a leader.

Durk: Now, I want to talk about our Serene formula. This is the drink that contains tryptophan and the co-factors needed to make serotonin. There're a couple of *other* things in there which are very unusual. The scientists at Hofmann-LaRoche who discovered benzo-diazepans found that there were *specific receptors* for Librium and Valium in the mammalian brain. Well, there aren't any benzo-diazepans in nature. That class of chemical is just not produced biologically! So what the hell are these receptors doing in there? Well, researchers went looking for natural ligands for the receptors and they found that *a combination of niacinamide and inositol* would do it. Now, niacinamide will not normally bind efficiently to these receptors, but the inositol changes the 3-dimensional configuration of the receptor to a high-binding mode for niacinamide. That's why we have niacinamide ascorbate and inositol in there.

RH: *Fascinating!*

Durk: So the Serene formula has distinct Valium and Librium-like anti-anxiety effects as well as anti-impulsiveness effects. In fact, if you take a dose of it with one Valium, Dalmane or other benzo-diazepan drug, you'll swear you

took two of them. And you won't have the hang-over you'd have if you had actually taken two.

Now, we use niacinamide ascorbate: that's a charge transfer complex of niacinamide and ascorbic acid (vitamin C) which gets the niacin into the brain. Ordinarily only about three percent of an orally-ingested dose of niacinamide ends up inside the brain: the blood-brain barrier keeps it out. But, the blood-brain barrier has powerful ascorbate pumps which import ascorbate into the brain against the concentration gradient. (In fact, the concentration of vitamin C in the cerebrospinal fluid, which is inside the blood-brain barrier, is ten times that in the blood serum.) Well, what seems to happen is the vitamin C drags its attached niacin along with it into the brain, because we've had a lot of people tell us, apart from our own experience, that the niacinamide ascorbate is a superior tranquilizer to niacinamide and ascorbic acid taken separately.

RH: *Wow! Gosh! Etc!*

Durk: Now, we can send you a couple of Users' Manuals that we wrote. One is the Rise and Shine and Serene High-Performance Users' Manual and the other is the Energy Cycle User's Manual. It explains the theory behind it and gives scores of scientific references.

Sandy: People are always amazed at the *idea* of a user's manual for food, let alone what you can do with the food when you really know something about it!

Durk: See, the thing to remember is that you -- your body, your brain --- are a biochemical factory. And what you put into the factory has a great deal to do with what the factory ends up making. And, of course, what it does make controls how you feel and behave. So if you're real clever, and you understand your biochemistry, you can cause very marked alterations in behavior. There were experiments on a bunch of Navy men who had long records of being in the brig frequently, like for drunken bar fights. All

these men had records of attempted suicide by violent means, like guns; and they were real Johnny-piss-off types; they'd attack you at the drop of a hat. The researchers found that all these men had very low levels of 5-HIAA (a metabolite of serotonin) in their urine, and started stuffing tryptophan in 'em, till they had normal levels. They all stopped being depressed, they all stopped being impulsively violent, they all stopped being suicidal.

Sandy: You know, it's incredible to think that if people would all follow this regimen, using these nutrients—the tryptophan and co-factors—it might be possible to wipe out most of the child-beating, wife-beating, elderly abuse; this type of flipout . . .

Durk: . . . And alcohol abuse. This is documented.

Jay Cornell: *But most child-abuse is committed by people who were abused as children; I mean, there's a psychological repetition going on here as well.*

Durk: Not a *psychological* repetition: it's biochemical. If you subject an animal to the learned helplessness paradigm — that is where the animal is punished by, say, electrical shock that is inescapable — this causes depletion of the catecholamines and serotonin in the brain. If the shock is subsequently made escapable, the animal will no longer attempt to escape it. I think the same sort of thing happens to kids who are abused. They end up having depressed levels of catecholamines and serotonin, which means they don't have a lot of ambition and they are very subject to impulsive violence.

Sandy: Yeah, they've become wimps. They've learned helplessness.

Durk: After that, they end up being sporadically and irregularly violent because they don't have enough serotonin, because their production of neurotransmitters has been affected over the

long run by the behavior they were exposed to. I don't think that psychiatry is at all necessary in these cases. You get their brain neurotransmitter levels up to normal and they'll be just fine.

Sandy: As a matter of fact, it is pretty well agreed now that talking-therapy alone is just not effective. What psychiatrists are doing now is treating people with various types of mind-altering drugs, trying to find those that work well for that particular patient. Usually they have to try a number of different drugs to find the right . . .

RH: Yes, and all the anti-depressant drugs deal with noradrenalin or serotonin or both; in-

Sandy: There's an awful lot of impulsive violent crime in this country. Serotonin deficiency!

creasing the levels or altering their receptors or whatever. I love the mechanistic nature of all this. . .

Sandy: Now, noradrenalin is effective for the type of depression where you can't get out of bed in the morning, all the things that used to be fun you're not interested in anymore.

Durk: . . . the kind of depression where you'd jump out the window, but you don't have the energy to get up and walk across the room and open the window.

Jay Cornell: It used to be called *Melancholia*, right?

Durk: The other type of depression, which is very likely to lead to suicide, is what they call *agitated* depression, where the people pace the floor, can't sleep, chew their fingernails, punch

out their dogs . . .

RH: Right. That's the serotonin-deficient variety.

Durk: . . . and this type may lead to really violent methods, like where a guy shoots his family, then shoots himself. That's serotonin deficiency, and the Serene formula takes care of that.

RH: I was talking to Royce Everone from the Foundation for Infinite Survival, in Berkeley. She'd read that when you take large quantities of amino acids, unbalanced, there's a good possibility of liver damage, and . . .

Durk: Well, that depends entirely on what you're taking, in what amounts. First off, taking straight phenylalanine alone — even in doses of ten grams a day — would get you awfully hyper, but it wouldn't hurt your liver. Only certain amino acids pose a problem to the liver: tryptophan is one to be careful with. There are problems getting tryptophan into the brain as well. First off, if you take the tryptophan in the absence of carbohydrate, your liver's gonna turn most of it to sugar by a process called gluconeogenesis, which puts a load on the liver and the kidneys. Secondly, if you do not have enough vitamin B-3 (niacin), your liver will turn tryptophan to B-3 with less than 2% efficiency, and some metabolic byproducts of that particular pathway, such as formate and quinolinic acid, are highly liver-toxic.

However, what we do is shut down this pathway from tryptophan to vitamin B-3 via quinolinic acid. The first enzyme in the series, tryptophan liver pyrrolase, is inhibited by the presence of large amounts of vitamin B-3, so we have a hell of a lot of B-3 in there. Incidentally, this stunt was used in Britain, where tryptophan has been used in psychiatric experiments as a tranquilizer.

RH: How much niacinamide do you add?

Durk: We use a tryptophan-to-niacinamide

ratio of 3 to 1. The ratio in the normal diet (which is safe) is about 50 to 1. But when a person gets normal amounts of B-3 and then suddenly quadruples their tryptophan intake, they can end up in trouble.

Sandy: How long does it take for this liver damage to develop?

Durk: Well, every time you have to produce a bunch of B-3 from tryptophan it's gonna do some damage. Fortunately, the liver is capable of healing very well, very quickly, compared with other organs in the body.

The next step is getting the tryptophan through the blood-brain barrier. Lots of things compete with tryptophan in getting through, including the branch-chain amino acids. So what we do is add some fructose, to release a little bit of insulin --- just enough to clear out some of those branch-chain amino acids, and get the tryptophan through slick as a whistle. Also, that fructose tells the liver, "Hey, you got lots of

Durk: ... the 1990's is going to be the decade of psycho-active soft drinks.

fructose, you don't need to do gluconeogenesis," 'cause the liver can convert fructose to glucose in one enzymatically-controlled metabolic step: tryptophan-to-glucose takes over a dozen.

Sandy: Yeah, we have metabolic charts that look like road maps—all these various pathways—and it's very clear why you need all these co-factors, but people wonder why they don't respond to plain tryptophan capsules.

Durk: Once inside the brain, the tryptophan has to be made into serotonin. The work that Wurtman and Wurtman did at M.I.T. shows that the tryptophan level in the brain is the number one rate-limiting factor for this reaction; number two

is B-6 level, and number three is the brain vitamin C level. Well, according to a U.S.D.A. survey of 37,000 Americans—a huge study—80% of the population was getting less than the F.D.A.'s R.D.A. of B-6. B-6 is absolutely necessary to decarboxylate the tryptophan to tryptamine. Worse than that, copper is an essential co-factor for the B-6 in the decarboxylation enzyme, and, according to the U.S.D.A., about half of all Americans are getting less than half of the R.D.A. of copper. That's why our formulations have lots of B-6 and the proper amount of copper, plus vitamin C and folate.

Sandy: The fact that 80% of Americans get less than the R.D.A. of B-6 may have something to do with the fact that there's an awful lot of impulsive violent crime in this country. Serotonin deficiency!

RH: *Has the FDA been coming down on you for the designer foods?*

Durk: Oh no, we've had no trouble at all. You see, our lawyer is Jay Geller, who worked for the FDA for seven years. In fact, he was their chief prosecuting attorney.

Sandy: Only somebody who's been in there can tell what they *mean* by their laws; there's such a lot of plain insanity to the drug laws.

RH: *Since you're self-experimenters, do you do six-month baselines? Do you watch your liver enzymes?*

Durk: Actually, we've each had nearly 1,000 clinical laboratory tests in the past twenty years and we started using these materials back around 1980 or thereabouts.

Sandy: Well, as we say in all of our writings, nothing is perfectly safe, and some people should not use supplements like phenylalanine or tryptophan. For example, people who are taking anti-depressant drugs that are monoamine oxidase inhibitors shouldn't use them be-

cause it may push their blood pressure way high. But we include all these warnings with our supplements.

Durk: And, of course, they're in the safety appendices of all our books. Now, the levels of vitamins and minerals that we are talking about are considered unconditionally safe by Dr. Hathcock, the FDA's chief consultant on vitamin and mineral toxicity. As to the amino acids, what we recommend per day is a maximum of four doses of Rise and Shine; that's only about half of the phenylalanine that a person normally gets in their daily diet. The maximum amount of tryptophan we recommend is a little more than you get in your daily diet, unless your diet is high in milk products. We're so careful on safety our copper products have a warning for people with *Wilson's disease* — there's about 200 of them in the United States.

RH: *Oh yes, this is the copper-accumulating disease.*

Durk: One of the things I think is going to be happening; if you take a look at the things people drink, most of them are psychoactive: alcohol, colas, coffee, tea . . .

Sandy: Look at JOLT. There's the trend. People want a psychoactive effect, and so JOLT is a tremendous success.

Durk: I think the 1990's is going to be the decade of psychoactive soft drinks. That's exactly what we have; we have psychoactive, nutrient soft drinks. And they are very distinctly psychoactive. I mean, take enough of the Rise and Shine, you do not feel like eating for twenty four hours, you don't feel like *sleeping* for twenty four hours, either. It's just like a speed run. But there are some differences. What cocaine and amphetamines do, they cause you to release a lot of noradrenalin, then block the reuptake, so you temporarily have a lot more in your synaptic clefts. But then your monoamine oxidases destroy stuff and eventually you crash, painfully, because you use the noradrenalin up



faster than you can make it. With a formulation like Rise and Shine, your brain makes very large amounts of noradrenalin, very rapidly. There is no depletion: you stop taking it, you just go back to being normal.

Sandy: Try it! You'll be amazed --- it's great for writer's block!

RH: *Sounds good! Now, we'll need it for all the editors, at least....*

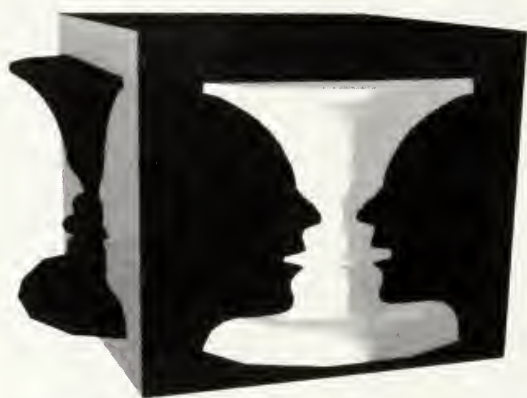
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*Here, they start talking off the record (too bad!) about their snakes: pythons! Sorry: this is really hot . . . the best . . . maybe in the aphrodisiac column, coming soon in High Frontiers, the family magazine for the family you've always wanted to have.*

**Editors' Note:** We took the liberty of supplying trade names for Durk and Sandy's formulations to assist the reader in her quest.



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Two beams of radiation can fuse to create a “material” particle-antiparticle pair and even the so-called “vacuum” --- devoid of both matter and radiation --- possesses inherent energy and physical



effectiveness. Here is the domain of the transduction processes between suprabiological mind and biological body, and between that body and the bodies of other greater or lesser minds, whose composite aggregate constitutes what everyone calls "the external world."

The zero-point energy of the vacuum, when manipulated by tiny psychosomatic volitional forces, can be the prime psychophysiological transducer, the signals transferred by small triggering fluctuations, then amplifiable through biocascade effects. Micro-singularities can create macro-controlling fields such as chaotic strange attractors.

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Such a primal basis on the microlevel has profound implications for theoretical biology and in particular for genetic theory and how genera and species proliferate by long and minutely connected sequences of orchestrated genetic (DNA/RNA) changes. RNA/DNA plasmids are the benign prototypes of viruses, and repeated organism/environment interaction leads by microprocesses utilizing ultimately quantum effects, to consequently and benignly adaptive RNA shifts which then lead to DNA insertions by reverse transcriptase and then consequently new replications.

The only scientific answer to the observed rich taxonomy in nature is the custom-tailored gene-transformation process, neuron-hormonally abetted, of allowing nucleotide codon-structures and the environment to interact. The neuropeptide system and the as-yet-in-

active genomes that can release new neuropeptides are the key to future evolution.

## **The Sphinx and the Brain**

The prime riddle-of-the-Sphinx was, Who art thou? The current one is, Who wilt thou be? It is the evolutionary future of humanity that is now, in the late 20th century, being weighed in the balance.

Actually, our physical forms are now quite determined and unchangeable: 10 fingers, 10 toes, 2 eyes, ears, hands and legs — and so on. But — and it is a big but — large areas in the brain are uncharted, the so-called silent brain; and even larger areas of the human DNA, the so-called "unused" DNA. Fact is that these silent areas can be made to sing in a new mainstream of evolution, and the unused DNA's genomes can be unlocked in a reciprocal, peptide-secreting neuron network, mediated by cerebrospinal fluid and the blood transmissions of the intricate cerebral vein and capillary network. We shall look here for the new programs for humanity, the new score still in the writing.

## **Ultrasonic Brain Music**

"Score" suggests musical score, and that idea is not far wrong. We now are working out melodies on ultrasonic levels that will gently resonate with neurosecretory areas of the brain, stimulating their activity by computer-generated sympathetic ultravibrations . . . more later . . . Also, in next *High Frontiers*: on the frauds of the pleasures of celibacy and the fears of the semen-saving chauvinists.

Andrija Puharich is one of the world's leading innovative scientists. His primary work has been to bridge parapsychology and medicine. An experimental researcher/physician, he has numerous patents granted in medical electronics, some effecting the treatment of hearing loss.

Twenty years ago, while an M.D. on the faculty of N.Y.U., Puharich massively discomfited his colleagues by studying the Brazilian healer, Arigo. He became even more notorious in orthodox circles when he described his uncanny experiences with Uri Geller in his best-selling book, *Uri*. His book *The Sacred Mushroom* chronicled some of the work at his research center in Maine where he collaborated with, among others, Bucky

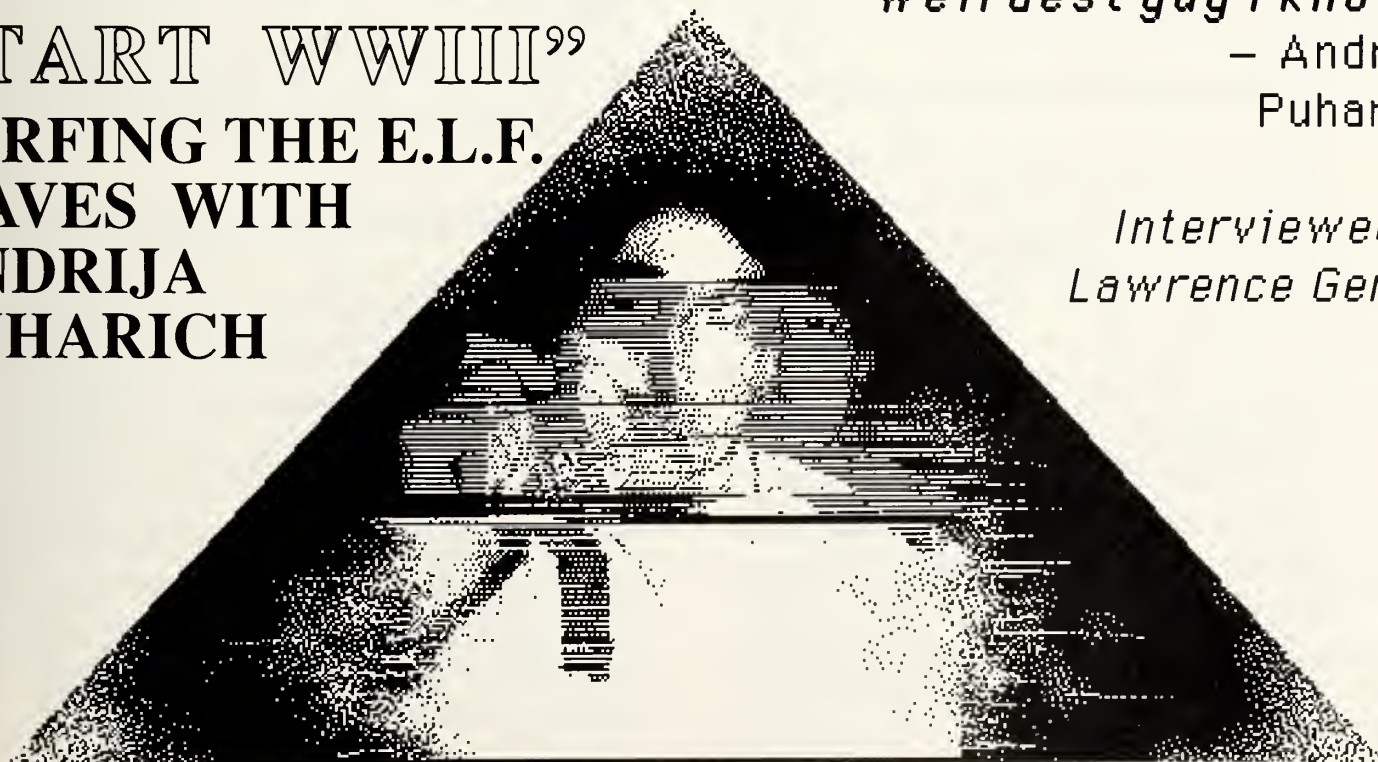
Fuller, Aldous Huxley, Harry Stone and Peter Hurkos.

Seeing that humanity now faces a critical survival test — neutralizing AIDS --- Puharich is presently focusing his energies on this challenge. It was at an N.Y.C. Psychotronics Conference on Disease and Biological Warfare Control that Puharich spoke to his colleagues on the subject of Extremely Low Frequency (E.L.F.) emissions. He believes that plumbing the relationship between electromagnetic force fields and healing could lead to novel understandings. Afterwards, Reality Hackers' Lawrence Gerald talked with Puharich about his scientific work, and was treated to some candid and revealing remarks about the politics of the parapsychology world.

“THIS GUY COULD  
START WWII”  
SURFING THE E.L.F.  
WAVES WITH  
ANDRIJA  
PUHARICH

“Uri Geller is the  
weirdest guy I know.”  
— Andrija  
Puharich

Interviewed by  
Lawrence Gerald





**Andrija. Puharich:** An incredible but absolutely true scene took place when Uri Geller was working on one floor at Stanford Research Institute (SRI). They had Geller bending metal, teleporting things, demonstrating incidents of telepathy and clairvoyance — these things were happening all of the time. Well, unbeknownst to us at the time, there was another lab upstairs for ARPA — a computer network system. Somebody put two and two together and said: “Hey, there’s a crazy kid downstairs who is

wipe them out? Would you cooperate?” So we took Geller to Bell Labs and to the Livermore Radiation Lab and they put together an elaborate set-up for magnetic shielding. They learned that he could wipe out anything on computer tape. They said to me, “This guy could start World War 3!”

The SRI incident was witnessed by a lot of very credible people. Captain Edgar Mitchell, the APOLLO astronaut who walked on the moon, was the overseer of the project. Russell Targ and Hal Puthoff conducted the experiments. Also participating on the team were John Hasted of Berbeck College in England; David Bohm, the great theoretician of Quantum physics, and Nobel Laureate Brian Josephson. There were about 40 people on the team.

Later the Secret Service came to me and asked if Geller could activate the Hot-Line between Moscow and Washington. I said, “I think he could but I don’t think he cares to. You’d have to pay him to do so.” They said they would then consider him a “Higher Intelligence.”

### ***Reality Hackers: Or Hired Intelligence!***

**A.P.:** Yeah! By then I’d taken Uri to England, Norway, Europe. Hundreds of kids started to bend metal as a result of seeing him, either on tv or in person. So I told these Government agents that there’s a lion running right through all their countries. Any kid on a caper could blow up the whole thing. It’s too late! So I think they gave up the idea of killing Geller. It didn’t seem practical anymore.

---

## **Could Geller activate the Hot-Line between Moscow and Washington? “I think he could but I don’t think he cares to. You’d have to pay him . . .**

---

bending metal and levitating things.” So they cross-correlated and discovered that when Uri did something the computers would go wacko: program printouts would pop out — sometimes partly erased --- the power supply would go out on them and so on. “Somebody can affect the computer!” Panic ensued. A squad of colonels came out from Washington to sniff around and watch Uri do his thing. They came to me and said, “You know, our whole defense system is on computers and magnetic tape cards. Can this guy

The next idea was to discredit Geller through a disinformation campaign developed by Ray Hyman and “Amazing” Randi. These turkeys concocted a smokescreen around Geller so that no one would take him seriously. Do you know about Randi? Randi works for the Disinformation Department in the Department of Defense — high level research projects. He started working there in 1973. He makes things difficult for legitimate psychic researchers. We can never get Randi to debate publicly. Peter Hurkos, the psychic, and myself have challenged him and he won’t deal with us. Yet the average Joe would say “Geller’s a fake. Randi proved it.” So they’ve done a good job — the Disinformation Squad. But it’s all horseshit, you know.

**R.H.:** *Sounds like a Max Headroom plot. What became of SRI?*

**A.P.:** It became a CIA research center — even to this day. I know this because I trained many of the psychics involved in the psychic warfare operation. I could tell you names, places, all that garbage. There are smokescreens deliberately set up to discredit parapsychology research or keep what they know concealed.

**R.H.:** *When was the last time you spoke with Geller?*

**A.P.:** When I was in London (July ’87). Uri did get prosperous enough that he’s able to live around the world. A recent article reported that he made forty million dollars being in show business.

**R.H.** *Not bad for an Extra-Terrestrial. What about your own career? You’ve achieved a certain amount of credibility in the straight scientific community, considering what you’re doing.*

**A.P.** Well, I’ve done my share of straight work.

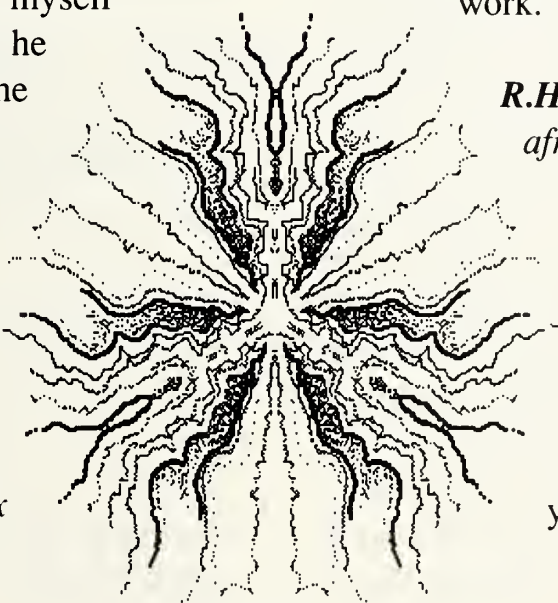
**R.H.** *But you haven’t been afraid to risk your reputation doing parapsychology.*

**A.P.** Some people worry about it. Your reputation is like a woman’s hymen. Once you’ve lost it, it’s gone forever. Right?

**R.H.** *And a certain freedom opens up. If your reputation’s at issue, it may mean that you’re on to something.*

**A.P.** When you’re a pioneer, you have to take risks. The risks never bothered me. The fun overcomes all of that.

I’ll never regret the time I spent in Brazil studying Arigo and bringing his amazing abilities to the attention of the world. It was rough — being an M.D. and teaching at N.Y.U. The dean was always



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calling me up, "What the hell ya doing?!" But they couldn't get me off the research project with Arigo. The county medical society called me in and I told them, "It's all real." I arranged for them to have a viewing of some film of Arigo in action. And they loved it!

*R.H.: When did you first meet Arigo?*

**A.P.:** Back in '61. I repeatedly took teams of doctors with me to study him up 'til about 1968.

When you're there watching him operate, you can't believe it's real. It shocks every sensibility. A guy walks up to him and Arigo says, "You've got a cancer near the pancreas. Pull up your shirt. Drop your pants." He pulls out a knife, opens it up, cuts open the intestine and glues the two ends together and somehow — just like that — the person is healed! There would be a couple hundred people lined up around his house waiting to be next. The average treatment was about two minutes. All this was done without anaesthesia or antisepsis.

*R.H.: What's really amazing is he'd do all of this without insurance!*

**A.P.** (laughter) It made medical practice look foolish. He made us look like idiots. We know nothing and he knew everything.

*R.H. So the book Arigo, Surgeon of the Rusty Knife, by John Fuller, was the only well-publicized information that came out about this work. Did you try and*

*bring him to the U.S.?*

**A.P.** I tried, but it was impossible because of the medical pressure. When you're in this field, you have special import immigration status for people with exceptional ability. That's how I was able to bring in Peter Hurkos and Uri. But AMA pressure was too great. It was easier to go down to Brazil to the culture he was working in.

*R.H. You've said that all the truly great psychics are working for the same intelligence. It's a beautiful thought.*

**A.P.** It's the only thing that's gonna save us. These psychics are under the influence of a super high power. Peter Hurkos is a top psychic for the U.S. Government. If there's a radar signature coming over the North Pole that looks like a missile, you'd think they'd call up the technical experts. No, they call up Peter. In ten seconds, he can tell if it's a dud or if it's real, and where it's going. That's a heavy responsibility.

*R.H. With all of your hobnobbing with psychics, have you ever wanted to go gambling with them?*

**A.P.** Just once, many years ago. I went to Las Vegas with a business partner. There were four of us, two were psychic. We were looking to break the odds. We had about \$20 to play with and our aim was to use our psychokinetic ability. There was one guy to pick out the best table, another to place the bet, and one to roll the dice. After three hours we had twenty thou-

sand! By that time, word was getting around the casino to get rid of us. It created a sensation! That was my only experiment like that.

**R.H.:** *You have finished a new book, The Magnetic Model of Matter. You also have some unique inventions, such as the Faraday Cage, hearing aids, the ideoscope (a special strobe light). All these can be seen as practical applications of your written work. Could you say some-*

---

## Any kid on a caper could blow up the whole thing. It's too late!

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*thing about how the Faraday Cage works?*

**A.P.** When you're inside it, a psychic, for example, has her performance increased by a thousand-fold. A Faraday cage shields you from all electromagnetic radio waves, allowing only extremely low frequency (E.L.F.) magnetic waves to get through. I don't think there's a psychic warfare research lab that doesn't make use of them today.

**R.H.:** *Do you have the patent on it?*

**A.P.** No. I applied for one but didn't receive it. I had a lawsuit with the Department of Commerce that went on for three years. A famous lawsuit. The judge

ruled that the invention couldn't work because E.S.P. doesn't exist. It was a funny case.

**R.H.** *What is the Ideoscope?*

**A.P.** It's an ordinary strobe light, but very high-powered. You look into this strobe light, a single point source, and you adjust the frequency of the strobe to your own alpha. When that happens, instead of seeing one point, you suddenly see two. It splits. What it does is separate the two halves of the brain functionally. And, what you then see is two circles, one on each point. When you see two circles move together, they form a vesica-pisces. In other words, a fish-like figure with a dark and light space. We've tried this out on successful businessmen who never heard of E.S.P., tested them, and they scored greatly! After five or ten experiences, you're ready for the next stage which involves a video tape with instructions that help you develop concentration levels that lead to out-of-body experiences at will.

**R.H.:** *You have one of the most famous published reports of teleportation on record. Uri was walking down a street in Manhattan and the next thing he knew he ended up 36 miles north at your old home in Ossining.*

**A.P.** He was with a woman named Maria Janis (she's Gary Cooper's daughter). He left the apartment they were in to go jogging. Within two minutes of leaving 68th and Park, he somehow landed in Ossining - 36 miles away. I was home



# Peter Hurkos is a top psychic for the U.S. Government. If there's a radar signature coming over the North Pole that looks like a missile . . . they call up Peter.

alone. I heard this huge crash and thought it was an earthquake. I couldn't find the source of it at first, and then I heard this bleak voice, "Andrija, Andrija!" There he was crumpled up on the floor. He was intact and wasn't hurt at all. I've had a lot of that kind of stuff with Uri.

*R.H. He's not in control of any of that, is he?*

**A.P.** He won't admit it, but I can tell you after researching him for years that he's E.T. Like *The Man who Fell to Earth*, he just wants to be a regular person.

*R.H.: Wouldn't it be better if he was more in control of the situation?*

**A.P.** Maybe it would be for you. He doesn't care. He's bored by the whole thing. I think he's waiting to get off the planet. Everyone thinks of him as a show business personality but his chief work for a long time was being in charge of psychic warfare operations for the Israeli Army. No matter where he works in the world, he basically works for them.

*R.H.: I've heard that in the '73 Egyptian-Israeli war, he knocked out Egypt's ra-*

*dar.*

**A.P.:** I was there.

*R.H. Wasn't that classified information which somehow got leaked out?*

**A.P.:** Well, *now* it's coming out. I asked him if I could talk about it, and he said, "Yeah, I don't care anymore." Sixteen years of high security and he's had it!

*R.H.: When was the last time you saw a UFO ?*

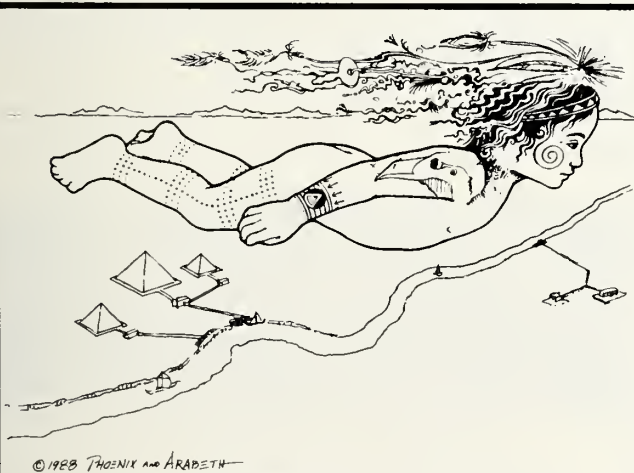
**A.P.:** A real UFO? (says this with an amused smile and a twinkle in his eye.) A few months ago. What they do is appear when I'm in danger. They give me a warning and take care of these CIA turkeys and such. But I'm not really interested in UFOs per se, or Uri, or metal bending. They are all just pointers on how the mind works. Nobody in the world ever heard of metal-bending until I started working with Uri. It took me about 10 years until I was able to measure the energy coming out of Uri's hands — which is 7 Hz instead of the usual eight. Now we know more about the nature of electron flow which, in matter, causes metal to bend. This is what I am most

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*R.H.: What do you think about super-conductivity?*

**A.P.** Very competitive research. It's gonna change all of life. I've got a research project in this area as well. All the magnetic energy, the magnetism inside any matter can be expelled, which is probably the way UFOs work. It requires no energy once you get it going.

*R.H.: I notice you are wearing a watch that says "Teslar" on it. Where did you get that?*

**A.P.** I have a company called E.L.F.(Extremely Low Frequency) Cocoon Corp. I designed this very sensitive piece of equipment. It gives off an 8 Hz frequency. The watch was a ten-year project. I began to understand that there is a frequency vibration emitted by all these healers. So I developed some unique equipment that could measure this. When healers lay their hands, or energy, on someone, they put out exactly 8 Hz magnetic frequency — the same vibration emitted by crystals. This is universal.

I was concerned about the E.L.F. warfare that the Russians had started using in 1976. They're bombarding everything and everybody. E.L.F. can be real bad for you as it can affect DNA at the right vibration. I spent three years trying to convince the American, British, and Canadian Intelligence communities that the Soviet E.L.F. signal does, indeed,

affect the DNA. At first they thought I was smoking some weird stuff but eventually they understood and acknowledged my ideas. So I developed something that would protect the individual from the E.L.F. — The Teslar. I named it after Nicola Tesla, whom I consider one of my most important teachers. The watch also dramatically lowers high blood pressure and prevents jet lag if you fly with it on.

I have been battling with the C.I.A. for the past two years because they have tried everything to suppress this invention. They don't want anyone to believe that E.L.F. exists and has adverse affects. Of course, now they're using it in covert warfare with the U.S.S.R.

*R.H.: You must have a great dossier! Whenever these agents are having a boring week they must say, "Let's see what Puharich is up to, get his file and see how we can slow him down."*


**A.P.** (disguised voice) "He's a prognosticator. We'll get on his trail and follow him." Man's gotta do what he gotta do.

*R.H.: And like they say, "When the going gets tough, the weird turn pro!"*

**A.P.** Yeah!

*Editor's note for those interested:  
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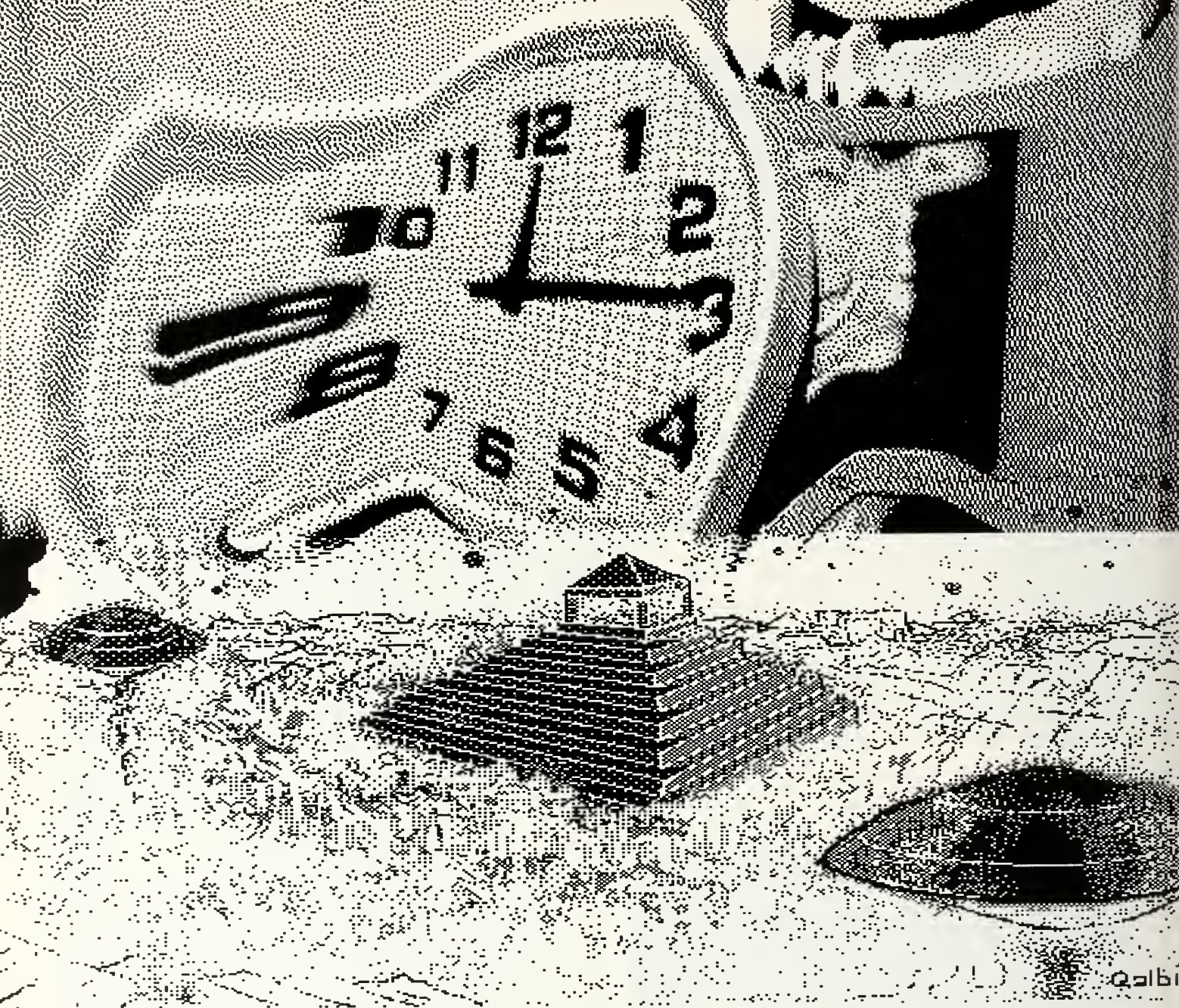
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# YESTERDAY IS JUST A SPACETIME TWIST AWAY

Nick Herbert

One of the most popular science fiction stories of all time is H. G. Wells' *The Time Machine*, a book that has remained in print for almost a hundred years. To make the notion

of a time machine plausible to his readers, Wells invented the idea that, like the three familiar space dimensions, time is likewise a dimension that extends backward into the past



and forward into the future. If time were really a dimension like space, then the past still exists “somewhere” and so does the future, and it makes sense to think of vehicles that could travel to these distant temporal locations. In 1895, when Wells published his time machine story, the notion of time as a fourth dimension, as well as the notion of a time machine itself, were completely fictitious, mere literary devices.

Hermann Minkowski had never heard of H. G. Wells, but Minkowski made the same claim with much better justification that time is really --- not just fictitiously --- a dimension on a par with space. Minkowski, a Lithuanian-born mathematician at the Zurich Polytechnical Institute, based his claim on Einstein’s then brand-new theory of special relativity. Published in 1905 while Einstein was working as an obscure patent clerk in Zurich, the theory of special relativity profoundly changed our notions of space, time and matter. The most famous consequence of special relativity is the equivalence of energy and matter:  $E=mc^2$  — the only equation ever to appear on the cover of *Time* magazine.

Einstein derived the equations of special relativity from scientific arguments drawn from physical facts, from the observed behavior of light beams as viewed from reference frames in different states of motion. Minkowski was not a physicist but looked at Einstein’s theory with a mathematician’s eye. From this vantage point, he recognized that Einstein’s work actually implied that time is a fourth dimension, or, more precisely, that time and space are not separate entities but are inextricably linked together in a four-dimensional continuum that Minkowski called “Spacetime.” According to Minkowski’s interpretation of Einstein’s theory, we do not live in a three-dimensional world that’s changing in time, as common sense suggests, but in an unchanging four-dimensional spacetime universe in which all events that have ever happened and all events that ever will happen are eternally present.

Einstein at first resisted Minkowski’s new notions but gradually began to appreciate the usefulness of four-dimensional thinking. Taking the notion of spacetime seriously, in fact, led Einstein to the greatest discovery of his career: the theory of general relativity.

Starting with Minkowski’s spacetime which was “flat,” Einstein’s restless mind began to toy with the idea of “curved” spacetime, a detour of the imagination that eventually led to Einstein’s general theory of relativity. The main idea of the general theory is that gravity is not a force exerted by massive objects, but the result of spacetime curvature. Massive objects, such as the Earth, warp the spacetime in their vicinity. An apple falls to the ground not because it is attracted to the Earth but because it is following a curved track in spacetime. A curious feature of Einstein’s theory is that not only space but also time can be “curved.” “Curved time” means that clocks in different places run at different rates not because of any defect in their construction but because they are correctly registering the “bent time” in their vicinity.

Einstein’s curved spacetime theory of gravity leads to many testable predictions such as the deflection of light by massive bodies like the Sun and the existence of black holes, regions of infinite spacetime curvature. Einstein’s general theory is also the first scientific theory that shows how to build time machines out of particular configurations of energy and matter.

Every solution to Einstein’s general relativity equations is a kind of topographical map of spacetime, detailing its hills, valleys and points of interest. Each configuration of matter and energy yields a different solution, a new spacetime road map. Of particular interest to prospective time travellers is the fact that some of these spacetime maps describe accessible pathways --- called “closed timelike loops” or “CTLs,” for short --- that actually wind back into the past. If CTLs actually exist in nearby regions of space-



time, then an ordinary rocketship could act as a time machine, by just following one of these special routes (marked in red, no doubt, on spacetime navigation charts).

The first spacetime map containing time-machine trajectories was devised by the celebrated Princeton mathematician Kurt Gödel, better known for Gödel's Incompleteness Theorem which sets strict limits on human knowledge about certain formal systems. To picture Gödel's solution, imagine an infinite universe lightly sprinkled with a fog of matter. Because of the everywhere-attractive force of gravity, this universe is unstable: it will tend to collapse upon itself. Now start this whole universe spinning at such a speed that centrifugal force exactly cancels out the tendency of the matter to collapse. The resulting model is called "Gödel's Universe".

The most surprising fact about this simple model is that sufficiently long round trips along the direction of the universe's rotation are actually CTLs. The denser the universe, hence the faster the compensatory rotation, the smaller the diameter of the round-trip paths that are CTLs.

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## To picture Gödel's solution, imagine an infinite universe lightly sprinkled with a fog of matter.

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So if we happen to live in a rapidly rotating universe, time travel would be a matter-of-fact travel option. We know that our own Milky Way galaxy is rotating, but galactic rotation is not enough. For everyday time travel, the whole universe has to spin. The rotation of the universe can be measured by looking at the light left over from the Big Bang. Has it travelled to us in straight lines or spirals? Accurate measurements of Big Bang radiation show no measurable rotational effects. For better or worse, we apparently

do not happen to live in a Godelian --- easy time travel ---- universe.

In 1974, Frank Tipler, now a mathematician at Tulane University, showed that time machines that did not involve rotating the entire universe were possible. Tipler discovered that CTLs will form in the spacetime around an infinitely long massive cylinder rotating so that its surface travels faster than half the speed of light. Probably finite cylinders would work as well, Tipler reasoned. Tipler's discovery was taken up immediately by science fiction writer Larry Niven, who imagined alien generals attempting to use Tiplerian cylinders as weapons. For the title of his war story, Niven appropriated the title of Tipler's article which had appeared in the prestigious American physics journal, *Physical Review*: "Rotating Cylinders and the Possibility of Global Causality Violation."

While Tiplerian time machines are possible in principle, they cannot actually be built because of an apparently accidental feature of our universe: our kind of matter is just not strong enough. Tiplerian cylinders must be enormously massive, hence subject to immense gravitational forces tending to collapse the whole structure and turn it into a black hole. The centrifugal force produced by the cylinder's rotation is sufficient to prevent radial collapse, but no such force opposes gravitational collapse along the direction of the axis of rotation. To oppose axial collapse the cylinder must be made of some rigid material highly resistant to compression. The feasibility of actually constructing a Tiplerian time machine depends on finding a repulsive force strong enough to hold back gravitational collapse.

The most repulsive force in this particular universe is the so-called "quantum degeneracy pressure" which is responsible for the stability of atoms and neutron stars. Strong as it is, the degeneracy pressure is just too weak to halt the gravitational collapse of a Tiplerian cylinder. Before you can begin to make use of such a



cylinder, it will have collapsed into a rotating black hole. A rotating black hole is called a “Kerr object” after the New Zealand mathematician Roy Kerr who first solved the Einstein equations for such objects.

The spacetime region around an idealized Kerr object also contains CTLs just like Tipler’s cylinders, but when more realistic calculations are made, taking into account how black holes come into existence, these CTLs seem to disappear. Thus real black holes --- as opposed to mathematical ones --- are probably useless as time tunnels.

The attempt to twist spacetime into re-entrant temporal loops by rotating some kind of very heavy stuff may not be entirely futile. At least one last loophole remains.

A black hole that rotates so fast that its angular momentum exactly cancels out its mass is called an “extreme Kerr object.” If an extreme Kerr object can be made to rotate slightly faster, a halo of CTLs would begin to form around it. Such an entity, which might be called a “super extreme Kerr object” or “SEKO” might be able to function as a practical time machine.

However, turning a rotating black hole into a SEKO may be exceedingly difficult, perhaps

impossible. Although SEKOs can mathematically exist, no one has found a feasible scheme for adding enough extra angular momentum to a rapidly spinning black hole to transform it into a SEKO. Another argument against the existence of SEKOs is that each one contains a “naked singularity”: a region of spacetime in which physics goes crazy. Many physicists believe that nature contains a “cosmic censorship principle” that mandates minimum clothing standards for singularities — all singularities must be covered by at least one one-way membrane

Although these arguments seem to preclude the use of Tipler tubes, Kerr objects and SEKOs as time tunnels, they do not eliminate the possibility that certain other configurations of rotating matter might create CTLs in their spacetime vicinity. The search for realistic solutions of the Einstein equations that contain flagrant CTLs seem to be a worthy use for large, fast computers. One might begin by investigating complicated configurations of black holes, two co-rotating Kerr objects, for instance, orbiting just outside of each other’s one-way membrane. The fact that certain solutions of Einstein’s equation unequivocally permit time travel is a tantalizing turn of events, suggesting that in the complexity of these equations may lurk the key to easy journeys into the past . . . courtesy of exaggerated twists in the fabric of spacetime.





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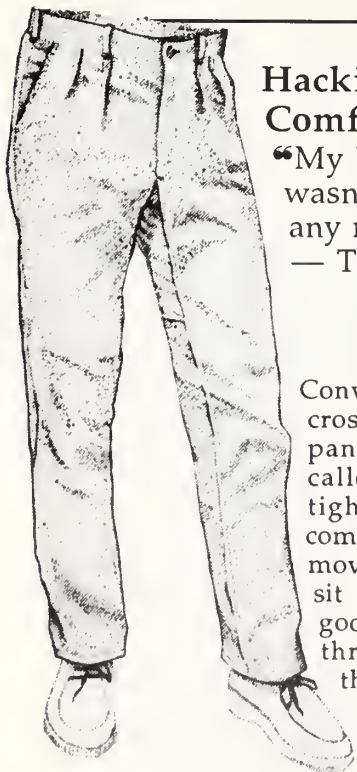
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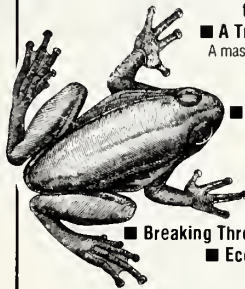


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Who can forget William Burroughs' byzantine rave in *The Job*? There he wove together deadly orgone, scrambling devices, gene splicing, Logos as virus, mechanisms of viral infection, and designer viruses. Now, nearly twenty years later, we have a Pasadena physician, Dr. Robert Strecker, suggesting that the AIDS virus is just such a designer virus — composed of the genetic material of two parent viruses, BIV (Bovine immunosuppressive virus) and visna (sheep brain rot) virus, with the genetic material to target it specifically to human T-lymphocytes spliced in.

*The Strecker Memorandum*, his ninety-seven minute video, explores a whole host of ungulate retroviruses and their adaptations to humans and suggests that they were deliberately "cooked up" in a biological warfare lab at Fort Detrick, Maryland. Dr. D. C. Gajdusek, the pre-eminent slow virus expert and Nobel prize winner for his work on Kuru

virus in New Guinea, vehemently denies that Fort Detrick houses any biological warfare labs and claimed in *Omni* that more communist scientists from the U.S.S.R. and mainland China have passkeys to high security P-4 labs than American scientists do. Strecker pounces on this as evidence that commie infiltrators at our own NIH are responsible for engineering AIDS and suggests that it was used to contaminate Hepatitis-B vaccines as a first foothold in the population — a foothold that would not be immediately recognized as the threat it is by the populace at large.

The Soviets however have long maintained that AIDS was created at Fort Detrick by American researchers. European scientists almost immediately rejected the African green monkey theory and over two hundred newspaper stories and documents have surfaced in seventy-four countries to support the claim that AIDS is attributable to "American military research gone awry." There has been a virtual blackout in this country on the AIDS origin speculation that runs rampant in the European press. Put this information together with what we *do* know about biological warfare testing on civilian populations (see Harris and Paxman: *A Higher Form of Killing*, 1982) and the implications are pretty telling.

Dr. Strecker comes across in the video as impeccably credentialed, intel-

lectually stringent, with an incisive grasp of virology. He is also politically right wing and his opinions are being seized on as political fodder by the LaRouchies. Before they throw all the gays into internment camps, get this: AIDS is *already* disseminated through the population. Strecker believes that the AIDS tests we now have don't reveal the full magnitude of its spread because the virus can hide in the macrophage.

As horrific as this thesis is, still worse is the allied suggestion that the AIDS virus "contaminated" smallpox vaccines in Africa. The entire continent of Africa may be doomed. Whether this was American imperialist or WHO-sponsored ethnocide, Faustian shenanigans, or scientific hubris, is difficult to say. More probably, the smallpox vaccine was accidentally contaminated with a BIV strain which has been pandemic in cattle in Europe and England for thirty years. The sequence homology of BIV to HIV is 90%. According to Durk Pearson, blood samples collected from children in Uganda as early as 1972 reveal that 60% of them had HIV. These questions *could* be answered without ambiguity if someone bothers to do the legwork: track down old flame-sealed ampoules of smallpox vaccine in dusty stockrooms of jungle clinics and test 'em. He suggests we look at colorful puberty rites where adolescent males have congress with young heifers, or scarification rites performed with the same knife that was used for cattle bloodletting, as among the Masai. (The virus will remain viable on the knife for at least eleven days.) Still this doesn't explain the adaptation of BIV to HIV in less than a generation when these practices have been around for thousands of years.

Controversies over the genealogy of AIDS are likely to rage for some time

as scientists attempt to pinpoint its progenitors. Evidence continues to mount that we have a true bio-holocaust out there. Strecker believes that the search for AIDS progenitors is meaningless. For reasons he delineates in the video, he believes that a vaccine against AIDS is impossible and that to pursue that research avenue exclusively will be a blind gut. Our only hope as a species, he feels, is to revive and massively upscale the anti-viral electromagnetic research of Dr. Rife. In his own practice, however, with up to sixty AIDS patients, he is extremely latitudinarian, supporting nutritional therapy, subliminals, ozone or anything else the patient wants to try.

*AIDS Treatment News* is published bi-weekly by John S. James (P.O. Box 411256, S.F., 94141; (415) 282-0110). It offers some of the best reporting on experimental AIDS treatments and European research. (\$25 per quarter, \$8 for persons with AIDS or ARC). Egg lecithin is one of the more effective (and certainly innocuous) treatments for AIDS. "INTREND", the developer, at (408) 429-1596 ; P.O. Box 8190, Santa Cruz, 95061, can provide more information on this substance as well as DHEA derived from barbasco root (*Dioscorea* sp.). Vitamin Research Products carries egg lecithin (known in the scientific literature as AL 7:2:1) which they market as "Eggs ACT". They are providing it to the Star Cross Convent in Santa Rosa where it is being used on infants born with AIDS. It can be ordered from Vitamin Research Products at (800) 541-8536.

Watch *High Frontiers #6* for an interview with Charles Piller on genetic engineering and AIDS. Piller is the author of *Gene Wars*, just out from Beech Tree Books, Wm. Morrow Publishers, 1988; \$22.95 hardcover.



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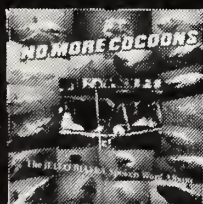
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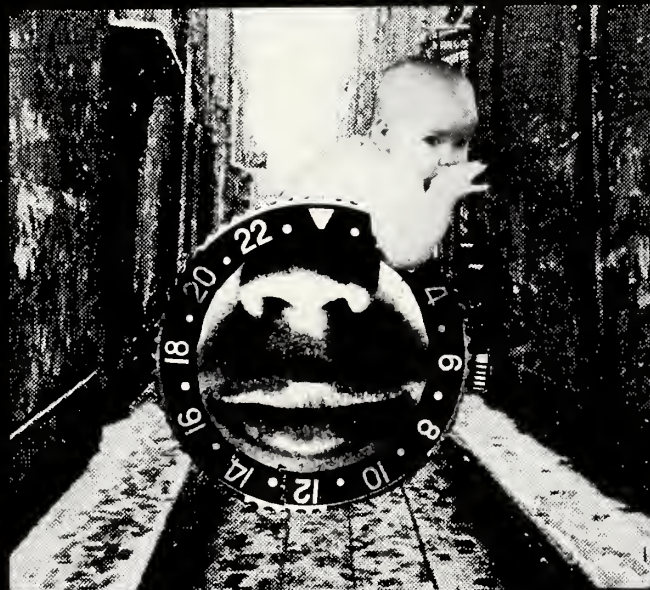
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# PSYCHEDELIC FUTUROLOGY IN BERLIN

by Terence McKenna

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BERLIN: Few place names in our political lexicon are so charged with intense associations: from the image of the burning Reichstag to the periodic "Berlin Crises" that were benchmarks in the Cold War of my childhood. I flew to Berlin last weekend quite unexpectedly, as a last minute stand-in for Tim Leary at FORUM FUTURUM, a futurological congress and New Age idea fair. It was held in the Kongresshalle, a UFOish building with circus tents nearby at the Tempodrom. My expectations were minimal — what I found blew my mind. Berlin is alive! Its life consists of a vital and activist underground community of punks, freaks, Greens, feminists, psychedelicos, New Agers and eccentric dreamers. All swirling around me in a non-stop party of people and ideas that runs on hash joints that one can smoke anywhere and beer to die for.

What we can learn from the German underground is that the path to political effectiveness runs through tolerance and unity. In the U.S., heavy metal punks and New Age types are poles apart and not likely to be aware of each other's agenda or defend each other's right to non-conformity. In Berlin there exists something that approaches an underground united front.

One of the events that I participated in was a panel discussion among myself, Robert Anton Wilson and Micky Remann, the international networker and pataphysical commando responsible for bringing me to Berlin. While we debated psychedelics, spaceflight and the End of History before a stoned and enthusiastic crowd of eight hundred that ran heavily to silver studded black leather, skin heads and violet hair, we were telecast and critically dissected by constipated mainline German eggheads watching on TV monitors in the relative safety of a pyramid-shaped glass studio a hundred yards away. "Obscurantists," sneered Joseph Huber, a leading German sociologist obviously appalled by the churning creative chaos. "Potentially protofascist," chimed in Robert Jungk, the octogenarian social philosopher who is known as a historian of the atomic age. To her credit, Eva Quistorp, feminist and founding Green member, tried to hold them back.

Meanwhile back inside the Tempodrom bigtop things were heating up. Joints were handed up to the stage: it was a liberating experience to get stoned at the focus of a thunderous public gathering. It lets you know what a sandbox our political dialogues here in America have become. Quickly the ebb and flow of rave and translation blurred to cacophony. At last we were having fun.

Berlin is dynamic and vital and Berlin is looking East. And so should we. During photophone connections to Moscow — the Berlin-Moscow Teleport — we looked into rooms in Moscow filled with musicians, poets and the new breed of dreamers unleashed by Perestroika. "Everything is now possible in Moscow," Joel Shatz, the photophone anchor in Moscow told us. And everything is happening now in Berlin. Hardly going to bed, I lived a week in three days while I was in Berlin. Be there or be square.



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What *were* the occult acoustic properties of the glass harmonica? Why was it banned in 18th Century Germany? What do the new sciences of Cymatics and Sentic have to say about the glass harmonica? **Continued** in Issue 6 of *High Frontiers*.

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